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Psychological Tests and Their Uses

Reviews the literature from January 1938 to July 1940 Earlier literature was reviewed in Vol. VIII, No. 3; Vol. V, No. 3; Vol. II, Nos. 3 and 4.

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FOREWORD

READERS WILL NOTE a number of changes in style in the physical make-up of this issue of the REVIEW. For suggestions leading to several of these changes we are indebted to Frank W. Hubbard. The Editorial Board, after careful consideration, has decided to place the bibliography for each chapter at the end of the chapter rather than at the back of the issue, as heretofore. Although there are certain advantages in the old position, it is believed that readers will find the new placement a convenience. The list of issues already published has been arranged on the inside back cover according to topic, and the forthcoming issues for the next year are given.

DOUGLAS E. SCATES

Chairman of the Editorial Board

INTRODUCTION

THE TERM "psychological tests" as used in this REVIEW includes tests of general academic aptitude, tests of aptitude in special fields, and instruments for the appraisal of personality and character. The scope of this issue is similar to that of previous issues on this topic. The main difference between the outline for the present number and that for June 1938 is that tests of infants and young children have been absorbed in the other chapters, and a chapter on projective methods in personality study has been added. The appearance of a chapter on projective methods is the natural result of increased research activity in that area during the last two or three years.

It should be understood that the bibliography does not list all the investigations concerned with psychological tests that were published during the period under consideration. Space limitations made careful selection a necessity. American research was emphasized, although pertinent investigations in other countries were not neglected.

The rather voluminous bibliography on tests of extra-sensory perception might logically have been included in this issue. However, both because the space was limited and because the relationship of such tests to education seems remote at present, a decision was made not to review them in this number.

It would be highly desirable for a review of this kind to include not only descriptive summaries but also critical evaluations of the different investigations. When several hundred studies are covered within a space of little more than a hundred pages, however, there is scant room for the detailed treatment which adequate criticism requires. Consequently this review, like most summaries of research, is mainly descriptive and factual rather than critical and evaluative, although there is a certain amount of evaluation with respect to the general procedures used.

ARTHUR E. TRAXIER, *Chairman*
Committee on Psychological Tests

CHAPTER I

Brief Overview of the Period¹

ARTHUR E. TRAXLER

Recent Test Summaries and Bibliographies

THE CONTRIBUTIONS of research to the construction and use of psychological tests have become so numerous that it is doubtful if any one individual, however industrious and efficient, could keep up with all of them unless he devoted his full time to the task. It is not surprising that under these circumstances summaries and bibliographies dealing with measurement have appeared frequently in recent years.

During the period with which this review is concerned several valuable reviews of research, pertaining wholly or in part to psychological tests, were made available. The June 1938 number of the REVIEW OF EDUCATIONAL RESEARCH, prepared by a committee under the chairmanship of Symonds (8), reviewed the literature on psychological tests for the period January 1935 to January 1938. Greene and others (4) prepared the December 1938 issue covering educational tests from July 1935 to July 1938. A brief summary of recent research on intelligence, aptitude, personality, and achievement tests was written by Ruch and Orata (7) for the December 1939 number of the REVIEW. Watson (10) presented an overview of the historical development and implications of intelligence, aptitude, and personality testing in the Thirty-Seventh Yearbook of the National Society for the Study of Education. Hildreth (5) revised and brought up to date her well-known bibliography of mental tests and rating scales. Buros (1, 2) performed a valuable service by publishing his *Nineteen Thirty-Eight and Nineteen Forty Mental Measurements Yearbooks*, in which hundreds of new tests were discussed by reviewers, many of whom made reference to research data in their comments. Wang (9) prepared an annotated bibliography of mental tests and rating scales containing 1,776 items. Some textbooks on measurement, such as Freeman's *Mental Tests* (3), contain a large amount of pertinent information about research relating to psychological tests. Hildreth's book is the most comprehensive single bibliography of tests, Buros' yearbooks provide the most detailed and thorough appraisal of new tests; Wang's volume is the most extensive annotated list of tests of intelligence, special aptitude, and personality. Other bibliographies are given in Chapter V.

Survey of Recent Trends in Psychological Measurement

Although there have been a few individual contributions that purport to exemplify new approaches to the measurement of intelligence, aptitude,

¹ Bibliography for this chapter begins on page 8

or personality, no wholly new trends are discernible in the period under review. Rather, there has been an extension and intensification of certain trends begun earlier. The preparation of the Terman-Merrill revision of the Binet test, the new revision of the Kuhlmann test, and the Bellevue Intelligence Scales, as described in Chapter II, have given added impetus to the use of individual intelligence tests of the verbal type. Improved group tests for obtaining IQ's have also been made available, but the tendency in recent group tests has been in the direction of breaking down the total score, mental age, or IQ into two or more aspects of mental ability. Thus, we have such new tests as the California Test of Mental Maturity, which purports to measure language and nonlanguage factors; the American Council Psychological Examination, 1938, 1939, and 1940 editions, which yields scores for linguistic ability and quantitative ability in addition to the total score; and Thurstone's Primary Mental Abilities Tests, which provide scores for seven "factors." The guidance values of none of these new scores have yet been established by research, although various persons have begun an attack upon this important problem.

Perhaps the most important, and certainly the most widely publicized recent application of intelligence tests, has been in connection with the revival of the nature-nurture controversy. The investigation and animated discussion of the influence of nursery school training and foster-home environment on the IQ, as exemplified in the Thirty-Ninth Yearbook of the National Society for the Study of Education and in various independent articles and monographs, have provided much new data concerning the question of the relative influence of heredity and environment on intelligence. This recent work has not, however, provided any entirely new approaches to the question nor has it fundamentally changed the point of view that most psychologists have held for many years. Few serious students of mental development have ever insisted that the IQ is dependent wholly on either hereditary or environmental factors. The question has always been one concerning the relative weight to be attributed to heredity and environment. The renewal of the debate over the question has performed an important service in reminding test users that shifts in IQ are to be expected under certain conditions and that interpretations of the results of mental tests should be made in the light of the nature of the measuring instruments used and of the whole background and history of the individual.

There has been considerable activity in the preparation, appraisal, and application of aptitude tests in a variety of fields. These tests are of great interest to counselors, personnel workers with potential employees, and to employers who want to increase the efficiency of their organizations. As Segel has pointed out in Chapter IV, a test that is valid for workers on the job may not be valid for guidance into an occupation, and vice versa.

Probably the most pronounced trends in personality measurement during the period have been the increased application of factor analysis and

the development of projective methods. Factor analysis was mentioned as a new technic of personality study in the June 1935 number of the REVIEW and a few studies were listed, a somewhat larger number of investigations employing factor analysis was reported in the June 1938 issue, but the total number was still small. Since that time there has been so marked an increase in such studies that the use of factor analysis may now be listed as one of the major technics of personality measurement.

The fact that so many reputable leaders in psychometrics have recently turned their attention to the measurement of personality and character augurs well for future progress in this field. It seems clear, however, that there is a fundamental difficulty with measurement in this area which has not been removed, and probably cannot be removed simply by the perfection of mathematical technic in the treatment of the data. Nearly all the leading personality tests continue to belong to the self-inventory type. The basic weakness of that type of test, that of eliciting truthful and dependable responses, requires no comment. It is probably this limitation in personality inventories as much as any other influence that has led to the growth of projective methods of appraisal, which are reviewed in Chapter VI.

Notwithstanding continued activity in the production of tests of personality and character, Rothney and Roens report in Chapter VII that there seems to be a decline in the application of tests in this area. This may indicate that potential users of personality tests have grown more critical and are insisting that the tests themselves first be evaluated carefully before they are applied on a service basis. Few of the several hundred available tests in this field can be recommended for anything more than trial and experimentation at the present time.

The marked increase in machine scoring since the advent of the International Test Scoring Machine in 1935 is exerting a gradual but inexorable influence on the form and the administration of tests in all fields. What was formerly the most frequently used semiobjective type of test item—the completion question—is being forced out of existence. There can no longer be any compromise with objectivity; all tests that are to be machine scored must be completely objective. Suggestions for adapting tests to machine scoring have been given in an article by Koran (6) and in various publications of the International Business Machine Corporation. One large noncommercial test publisher, the Cooperative Test Service, has recognized from the beginning the importance of machine scoring and has adapted nearly all its tests so that they could be scored by this procedure as well as manually; certain other publishers are assuming a similar point of view. The recent addition of an item analysis unit to the scoring machine increases its significance for research work.

On the whole, the newer psychological tests have been more carefully constructed than most of those prepared a few years ago. A test of whatever kind, however, is worth the serious attention of school people only if it has practical meaning—only if it yields scores that have values for

educational or vocational guidance or for the clinical analysis and treatment of a weakness of some sort. The greatest single need for research on psychological tests appears to be the discovery of the relationships between scores and success in educational and vocational fields, or between scores and adjustment as determined by dependable criteria. This calls for a variety of longitudinal and follow-up studies. It also calls for co-operation, for no one individual and probably no single organization can do the job alone.

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CHAPTER II

Current Construction and Evaluation of Intelligence Tests¹

DEWEY B. STUIT

THE CONSTRUCTION of new mental tests, both group and individual, during the past three years has been limited. Revisions of older tests have been more numerous. In a sense it is hardly possible to construct a distinctly new test at this stage in the history of mental measurement. The situation is somewhat analogous to the field of automotive engineering. The automobile is constantly being improved but to date has not been replaced with a radically different mode of transportation. Likewise, test construction now is largely a matter of refining present instruments by new and old statistical methods, discarding weak items or sections, improving ease of administration and interpretation, and providing better norms. The time may come when we shall see an entirely new technic in mental measurement but to date it has not appeared.

Individual Intelligence Tests (Verbal)

New and Revised Tests

The measurement of adult intelligence has persisted as one of the major problems in psychological testing. To fill this need Wechsler (75) constructed the Bellevue Intelligence Scales. The most distinctive feature of these tests is that the average performance of individuals in any age group is taken as the point of reference for that age group. The net result of this procedure is that older subjects generally receive higher IQ's on the Bellevue Scales than they do in other tests of general intelligence. In general, the test results have agreed remarkably well with clinical judgments. The ten subtests, five verbal and five nonverbal, are as follows: Information Test, General Comprehension, Combined Memory Span Test for Digits Forwards and Backwards, Similarities Test, Arithmetical Reasoning, Picture Arrangement Test, Picture Completion Test, Block Design Test, Object Assembling Test, and Digit Symbol Test (alternate—a vocabulary test). Since a point scale is used the individual's intelligence rating is obtained from a summation of credits awarded for passing various test items. The IQ can be computed from the individual's performance in the full scale, verbal scale, or performance scale. Intelligence quotient tables in the appendix afford an easy means for converting the weighted scores into intelligence quotients.

¹ Bibliography for this chapter begins on page 21

The method of standardization employed is worthy of special note. For the adult norms over 1,800 subjects, both male and female, ranging in age from seventeen to eighty and coming from all walks of life, were examined and their records placed in a file. From this file, cases were taken to match the general occupational distributions of the census population. The number of adults in the standardizing population was approximately 1,000. The children's sample was taken so that it matched the age-grade distribution in the New York public schools. About 2 percent, the lower-grade defectives, were taken from patients up for commitment at Bellevue or cases already committed to some New York institutions for the feeble-minded. In the case of both the adults' and children's samples it was assumed that individuals from New York State were representative of the nation as a whole.

The chief advantages claimed for the Bellevue Scales are: (a) the material is well suited for the testing of adults; (b) an individual's performance is compared with the average of his own age group; (c) the full scale gives appropriate weight to performance and verbal tasks; (d) the test results agree better with clinical judgments than those obtained from other general intelligence tests; and (e) the test is not difficult to administer.

The Tests of Mental Development, an individual examination constructed by Kuhlmann (40), constitutes a most important contribution to the field of intelligence testing. The tests making up the scale are drawn from a wide variety of sources including the author's previous revisions of the Binet Scale and the Kuhlmann-Anderson group tests first published in 1927. Two basic principles from the Binet Scale were retained in the new scale. First, mental development is measured in terms of median abilities of children of different ages, the results being expressed in terms of mental ages or mental growth units and, second, the increase in median raw score on a test between adjacent ages constitutes the chief criterion of its validity.

Several distinctive features have been incorporated in the new scale. The use of the Heims Mental Growth Curve in the selection and scoring of the tests is a unique feature. The result is that one test is administered or scored at every third point in this curve. A test's position in the scale was determined by the requirement that 50 percent of the children had to pass it at that point. A total of four new scores is yielded by the scale, the percent of average (PA), a speed score, an accuracy score, and a variability score. It was suggested by the author that the latter is not fully satisfactory, but it does attempt the measurement of an important aspect of a subject's performance.

The standardization population consisted of white children in the public schools of small and medium-sized towns of Minnesota, with the exception of four children at each age up to five years inclusive who were from St. Paul and Minneapolis. Names and addresses of children in the pre-school classification were taken from the birth registration records. In all cases birth dates were very close to examination dates. The author cited

data to show that Minnesota is a fairly typical state. Perhaps the most serious limitation of the norms is the possible effect of elimination from school.

The complete scale, designed for testing individuals from a chronological age of four months to adulthood, consists of 89 tests arranged in order of difficulty. In administering the examination the examiner begins about fifty growth curve points below the estimated mental age. The tests are given in order from lowest to highest and are continued until it appears reasonably certain that no more successes will be scored. Tests may be administered in a different sequence if such a procedure seems preferable. A convenient score card is provided for recording the individual's responses in terms of rights, wrongs, and time, depending on the item. The score is easily translated into mental growth units which must then be converted to a mental age score, a percent of average score, or an IQ. The latter can be computed by means of tables provided in the appendix.

This mental examination may appear formidable to a number of clinical psychologists. Careful study is necessary to achieve mastery of the scoring technics. After this has been accomplished the examination will provide the clinician with an array of facts which should prove helpful in the diagnosis of mental ability. However, further research is necessary before definite conclusions can be drawn regarding the clinical value of the data yielded by the scale.

The Detroit Tests of Learning Aptitude (6) have recently been revised. There are still nineteen tests in the scale, but the name of one test has been changed. According to the author the chief value of the tests lies in their diagnostic results and the application of these to learning situations. The interested reader should consult the February 1938 issue of the *REVIEW OF EDUCATIONAL RESEARCH* concerning criticisms of the scale in its original form.

Evaluation of Stanford-Binet Tests

The largest number of evaluative studies pertain to the old and new Stanford-Binet. Comparisons between the total scores and performance in the subtests of these two well-known measuring instruments have recently appeared in literature and have been concerned primarily with the problem of agreement between the scales and the direction of change in cases where changes were observed. Merrill (46), in a study of 1,517 school children who had previously been examined with the old scale, reported that examination with the revised scale showed close agreement between the intelligence ratings. Inspection of the distribution of gains and losses indicated that IQ losses were found more frequently in cases testing below 100 while IQ gains were found more frequently in cases testing above 100. The larger standard deviation of the revised scale would lead one to expect such results. In this connection the finds of Rheingold and Perce (56) are of interest. These investigators compared the scores

on the original and the Revised Stanford-Binet Scale, Form L, at the high-grade mental defective levels. The scales were administered consecutively with such changes that any difference in scores could be attributed to a difference in the content of the two scales. The results, in terms of IQ's and mental ages, showed a high degree of correlation between the scales, but there was a tendency for the Form L intelligence quotient to be higher for subjects with IQ's from 70 to 82. The latter finding is in contrast with that which would have been expected on the basis of Bernreuter and Carr's theoretical computations (11) and also fails to agree with Merrill's results (46).

In the Wayne County Training School, Hoakley (34) found that in general the Terman-Merrill IQ was higher than that obtained by the use of the Stanford-Binet. However, analysis of the data revealed that between the ages of ten and thirteen inclusive, the Terman-Merrill IQ was lower than the Stanford-Binet. From fourteen years up, the Terman-Merrill IQ was found to be higher. Using the Heinis Personal Constant in place of the IQ the author found the two tests to be in remarkably close agreement. Munson and Saffir (51) retested one group of 1,000 children with the old Stanford-Binet and a second group with the revised scale, the old Stanford-Binet having been used in the original testing. They found a drop in IQ with either scale but the drop was smaller when the revised scale was used. The investigators concluded that the change in IQ is no greater with the revised scale than with the original one. Atwell (5) compared the ratings of 100 unselected subjects in the vocabulary test of the Stanford-Binet and the Terman-Merrill Revision. The average mental age in the Stanford-Binet was fourteen years, whereas in the Terman-Merrill Revision it was seventeen years and four months. However, the percent of words known on the two tests was the same and the correlation between the two tests was .86. Elwood (25) also found the vocabulary test in the Revised Stanford-Binet Scale, Form L, to be easier than the vocabulary test of the old Binet as indicated by the larger percents of success at the lower mental age levels.

Interpreting Patterns and Variability in Scores

Irregularities in patterns of successes on the 1916 Stanford-Binet and the 1937 revision constitute an interesting and important problem for clinical psychologists. Some have interpreted scatter as an indication of psychotic trends while others have regarded it as a symptom of unevenness in test difficulty. Harriman (31) found in a study of 200 sixth-grade children, 175 of whom had a basal mental age of ten and 25 a basal age of eleven, that 52 percent achieved successes in one or more items at the fourteen-year level and 3 percent scored successes at the Superior Adult III level on the 1937 revision. With respect to specific items the results are even more striking. For example, at the average adult level, 40 percent of Harriman's subjects succeeded in the codes, but only 10 percent ex-

plained the proverbs. The average IQ of these subjects was 112. The vocabulary test furnished the best single criterion for estimating how far a pupil might achieve on the scale. It was suggested by Harriman that the clinical experience gathered with the use of the 1916 revision is not directly applicable to the 1937 revision.

Using four different measures of scatter, Harris and Shakow (32) investigated the variability of performance in the Stanford-Binet of 154 schizophrenic, 133 normal, and 138 delinquent adults. Of the various factors studied—psychotic condition, delinquency, chronological age, education, length of hospitalization, attitude, and mental age—only mental age proved to be related in any considerable degree to amount of scatter. When the groups were matched with respect to mental age the differences which originally existed tended to disappear. The Pressey measure of scatter was found to be superior to the other measures used in the study.

Berger and Speevack (10) studied the range of scatter among 196 retarded children on Form L of the Revised Stanford-Binet. They found that when the test was extended beyond the first-year level in which all items were failed, the MA was increased on the average by two months, the range of increase extending from zero to fourteen months. Increases occurred in 42 percent of the cases, resulting in an average increase of 3.2 months in MA for this group. The items frequently passed beyond the first zero point were drawing of designs from memory, making of change, picture absurdity, and the word memory and problems of fact at the thirteen-year level.

The findings of Hildreth (33) confirm those of other investigators with respect to size of IQ and range of successes in the 1937 revision of the Stanford-Binet when compared with the 1916 revision. In this study it was found that for subjects ranging in age from six to seventeen there was a substantially larger increase in IQ when children originally given the 1916 edition were retested with the 1937 edition than when they were retested with the 1916 edition. There was an increase in IQ approaching statistical reliability for those taking the new and old forms of the test, and the range of success on the revised tests for subjects basing above the ten-year level was found to be substantially greater than on the 1916 revision. The greatest increment in score occurred at the eleven-, twelve-, thirteen-, and fifteen-year age levels. With respect to this point, Hildreth's findings are in disagreement with those of Hoakley.

Clinical Evaluation

The most lengthy criticism of the 1937 revision of the Stanford-Binet has been written by Kent (37). Her criticisms were written from the point of view of a practical clinician and center around the complexity and rigidity of the new scale. It is the judgment of Kent that language test material should be developed according to the method used by Pintner and Paterson for a group of performance tests. An item which can be

graded in difficulty should be developed into a graded series and standardized as an independent unit. With a sufficient number of test units available, the examiner could make up a battery custom-made to fit the individual subject. The median performance in such a series of independent ratings could then be taken as the most typical of the individual. Since items cannot readily be lifted out of the revised Stanford-Binet and be replaced with more suitable ones, Kent expressed herself as believing that the scale lacks the flexibility which should characterize a mental test suitable for clinical practice. The latter criticism has also been made by Krugman (39).

In a somewhat dissimilar vein Vernon (73) argued that the clinical psychologist has a tendency to rely too heavily upon his personal experience and is, therefore, in need of the highly objective devices provided by the psychometrists. According to Vernon, the revised Stanford-Binet gives the clinical psychologist an excellent psychometric device which at the same time permits the necessary flexibility to control the subject situation as it obtains in individual cases. That many clinical psychologists share this point of view is attested to by the wide use of the new Binet scale.

Other Studies and Evaluations

The question of correlation between various mental tests is one of extreme practical importance as well as of theoretical interest. Arthur (3) studied the results obtained by administering the Kuhlmann-Binet and Stanford-Binet to two hundred subjects and found the median difference in IQ's to be three points. Using the Henis Personal Constant she found a median difference of two points. She concluded that the agreement is as great or greater between the two scales as it is between test and retest scores using the same scale. Naturally there were some cases showing a large discrepancy between results in the two tests.

The present wave of interest in factor analysis has also invaded the field of individual tests. Wright (82) recently completed a factor analysis of the items in the old Stanford-Binet passed by between 10 and 90 percent of a group of 456 ten-year-old children. Upon rotation, there appeared a common factor for which two explanatory hypotheses were offered: first, that it represented Spearman's "G" and, second, the one preferred by Wright, that it was an effect of maturation. The primary factors tentatively identified were Number, Space, Imagery, Verbal Relations, and Induction. A sixth factor apparently involved reasoning ability and a seventh could not be interpreted.

To date, but one evaluative study of the Wechsler Scale has appeared. Balinsky, Israel, and Wechsler (7) compared the relative effectiveness of the Stanford-Binet and the Bellevue Intelligence Scale in diagnosing mental deficiency. They found the Bellevue full scale to be distinctly superior to the Stanford-Binet, assuming that psychiatrists' judgments con-

stitute an adequate criterion for judging mental deficiency. The full scale was found to give better results than either the verbal or performance scales alone. These investigators reached the judgment that performance tests should be included in attempts to differentiate between borderline intelligence and mental deficiency.

The limitations of infant and preschool tests in the measurement of intelligence have been discussed in some detail by J. Anderson (1). The author cited evidence to show that the type of intelligence measured early in life is not the same thing that is measured by intelligence tests at later stages of maturity. Since development is a timed series of relations or sequences, there are functions which are measured only in part at one stage but which can be measured more completely at later stages. The result is that the correlation between early and late scores in intelligence tests is likely to be low. In addition, if tests are administered in childhood, the errors of measurement are likely to be greater and hence less reliance should be placed on the results obtained by means of one test. These arguments of Anderson would seem to imply that intelligence test scores obtained early in life are not reliable indexes of later intellectual status. Such a conclusion is indeed far-reaching in its practical and theoretical implications.

Group Intelligence Tests (Verbal)

New and Revised Tests

Among the recent new group tests is the Fifth Revision of the Kuhlmann-Anderson Tests. Several departures were made from the old arrangement of tests to eliminate from the lower ages or to move to higher ages tests dependent on school training. The range of mental ages possible was increased for the Grade II booklet and in the Grades VII-VIII booklet. Improvements were also made in the instructions for administering the tests and in the method for securing median mental age or mental growth units. R. Anderson (2) cited evidence to show that the tests are not mere measures of school achievement.

The new Pintner General Ability Tests, Verbal Series (52) consist of four batteries of mental tests, namely, the Pintner-Cunningham Primary Test, Pintner-Durost Elementary Test, Pintner Intermediate Test, and Pintner Advanced Test. The elementary test is still in preparation. The primary test consists of seven subtests, and the intermediate and advanced tests each consist of eight subtests. There are two forms of each battery available. The individual's score is computed in terms of median mental age in the several subtests. A nomograph is provided by means of which IQ's can be computed. The nature of the test and its method of standardization make it appear to be one of our better group tests.

One of the most interesting revisions of the Army Alpha Examination has been prepared by Guilford (29). This revision is based upon an

analysis of scores made by a sampling of University of Nebraska students in forms 5, 7, and 9 of the original Alpha and the Bregman revision. Comparison of the performance of high and low groups revealed that some items showed no difference between the groups and others showed negative differences. In the new revision the poor items were deleted and a better arrangement of items in order of difficulty was achieved. A factor analysis of the scores revealed the presence of three factors: V, the verbal factor; N, the number factor; R, a "relations" factor. The revision can be scored, for these factors and norms based upon the performance of University of Nebraska students have been provided. The difficulties encountered in scoring a test for primary mental abilities were fully discussed. Individuals who are interested in measuring these aspects of mental ability should find this revision of the Army Alpha useful in their work.

The Personnel Test developed by Hovland and Wonderlic (35) is a revision of the Otis Self-Administering Test of Mental Ability, Higher Form. By analysis of the items in the old test the authors were able to reduce the length of the test by one-third, making it possible to administer it in twelve minutes. Correlations between the Personnel Test and the Otis ranged from .81 to .87. Since the test was designed primarily for use in business personnel work, the authors did not provide tables for converting raw scores to mental ages. It is possible, however, to translate scores from the Personnel Test into comparable scores on the Otis. Norms for representative industrial and business groups are provided. Three forms are available.

Other new tests or revisions which have recently appeared are the California Short-Form Test of Mental Maturity (66) and the Detroit Beginning First-Grade Intelligence Test, Revised (26). Annual forms of the American Council Psychological Examinations for High-School and for College Students have continued to appear.

Evaluations of Group Tests

Careful studies of validity and reliability coefficients and norms presented by test authors are all too rare. An example of the type of study which should be made of every mental test is Traxler's investigation (71) of the reliability, validity, and practical utility of the California Tests of Mental Maturity. He found the reliability coefficients for his group of 74 ninth-grade pupils to be slightly lower than those reported by the publishers. The language and nonlanguage factors were found not to be highly correlated in a group of 21 eighth-grade and 73 ninth-grade pupils. However, the total score in the test did correlate highly with the Kuhlmann-Anderson tests of mental ability and with the American Council Psychological Examination. The differences between language and nonlanguage IQ were found to be much greater for superior than for inferior readers. Possible use of the tests for measuring the intellectual capacity of poor readers is suggested by the findings.

The results obtained when tests are readministered after long intervals of time are frequently discouraging. However, Davidson (23) reported a high correlation between the scores made by subjects in the old form of Bureau Test VI and the most recent revision of the test, the latter having been given approximately ten years later. Despite the fact that the material in the two tests is not closely comparable, the correlation between the test scores for fifty subjects was found to be .89. The test results were also found to correlate highly with level of clerical work achieved by the subjects included in the study. Results such as these are favorable to the use of intelligence tests in industry.

Those who make use of test results often feel the urge to break down a total score into its several parts. Because the necessary research data frequently are lacking, meaning cannot be attached to many subtest scores. In a study of the American Council Psychological Examination, Super (67) investigated the differential prediction value of the Q and L scores by correlating them with performance in the Nelson-Denny Reading Test, Cooperative Survey Test in Mathematics, and the two parts of the Minnesota Vocational Test for Clerical Workers. The correlation between L scores and reading ability was .80 while a coefficient of .37 was found between Q and reading scores. All other differences in correlation for the Q and L scores were small. The Q and L scores predicted success in mathematics with equal efficiency. From a guidance standpoint, it would seem that one would not be justified in using the quantitative score as a differential predictive index of achievement in mathematical subjects.

The question frequently arises whether tests administered in high school give the same results as those administered in the fall to entering college freshmen. Thomson's study (68) throws some light on this question. A group of 106 college freshmen took the 1935 form of the American Council on Education Psychological Examination as high-school seniors in January 1937 and in September as entering college freshmen took the 1937 form of the test. The correlation between the gross scores was found to be .87. When the scores on the 1937 form were converted into equivalent scores on the 1935 form it was found that 49 percent of the scores changed twenty or more points while approximately 5 percent changed forty or more points. Thomson concluded that when dealing with large groups for the purpose of predicting college success it makes little difference whether the ACE test is administered during the last year of high school or upon entrance to college.

Performance Tests

New and Revised Tests

One of the most recent performance tests to appear is the Carl Hollow Square Scale (18). This test was designed for use with adults and older children. The materials consist of a wooden panel in which is cut a $4\frac{1}{2}$

inch square hole, and 29 blocks of varying straight line geometric forms, each having both straight and bevelled edges. The problem is to fill the hole with blocks which are presented to the subject in groups of three or four. A total of twenty exercises are used in the test. The observant subject will note that certain combinations are repeated and consequently will be able to do some of the more difficult exercises with comparative ease. Each of the exercises is timed and the number of moves is counted. The score, based on the subject's speed and accuracy, is translated directly to an IQ which can then be converted into a mental age score. The test correlates well with other measures of mental ability, both of the verbal and nonverbal type. While the author admitted that the test measures mental abilities which lean to the practical or concrete, he insisted that it is not a test of highly specialized abilities. It would appear, however, that the test possesses possibilities as a mechanical aptitude test. The administration and scoring procedures appear a bit complicated and should be mastered thoroughly before the test is used seriously.

Grove (28) introduced certain structural modifications in the Industrial Model of the Kent-Shakow Formboard Series, thereby simplifying the tests and facilitating the administrative procedures. The number of subtests was reduced from five to four and the scoring system modified to give proper weight to time and error factors. Data were presented describing the correlation of the series with other performance tests. The author believes that the revised series may be said to measure ability to solve problems presented in the form of concrete spatial relations. That the test does not measure the same type of mental functions as those measured by the Stanford-Binet is shown by the correlation of .43 between the two tests.

Shakow and Pazeian (58) presented adult norms for the Clinical Model of the Kent-Shakow Formboard Series, thus increasing the usefulness of this mental examination. Scoring is in terms of decile rank derived from time scores.

The most recent revision of the Ferguson Formboards was prepared by Wood and Kumin (80). Instead of scoring the tests exclusively on the basis of time required to complete a board, these investigators took into consideration the blocks correctly placed at the end of the allotted time, which is five minutes for each of the six boards. In addition, they divided the five-minute period into fifteen 20-second intervals and worked out a score value for each. Results obtained by the authors indicated that the correlation between Stanford-Binet mental age and Ferguson score is distinctly lower for retarded children than for those in the middle and upper ranges of mental ability. They concluded that in the lower group, intelligence is less of a factor in performance than a special aptitude.

Studies and Discussion of Performance Tests

The controversy over the relation between "verbal intelligence" and "practical intelligence" is still not settled. Slater (60) made a factor

analysis study of several tests purporting to measure spatial judgment and verbal ability. The existence of a mechanical ability distinguishable from both general intelligence and spatial judgment was not confirmed. It was found, however, that spatial judgment or "practical ability" is an independent psychological function. A new Form Relations Test, differentiating between recognition and imaginative manipulation, was found to be a measure of the spatial relations factor. Some evidence was presented to show the value of the tests in selecting trade and engineering apprentices.

The use of the Porteus Maze Tests in clinical practice was discussed in two recent studies. Brill (15), in a study of fifty socially well-adjusted and fifty seriously maladjusted mentally deficient boys, found that the maladjusted boys scored higher on the average than the well adjusted and concluded that earlier statements as to the validity of the test in measuring social adaptation were not fully justified. In reply, Porteus (55) pointed out that Brill's interpretation of feeble-mindedness was not in accordance with accepted standards and cited further evidence to indicate the validity of the test as a measure of the subject's prudence and planning capacity. In addition, Porteus emphasized that the maze test is a supplement to and not a substitute for the Binet.

The effect of practice upon achievement in performance tests is of considerable interest. Mitrano (49) made a study of the readministration of the Witmer formboard by investigating the performance of fifty-seven feeble-minded subjects who had taken the Witmer and Stanford-Binet tests on four different occasions. The successive scores in the Witmer test were progressively higher and increased in magnitude twice as rapidly as did the corresponding Stanford-Binet scores. Subjects scoring highest in the Stanford-Binet showed a slight tendency to profit most from their previous experience in taking the Witmer test.

The relationship between performance in verbal and nonverbal tests of intelligence for bright and dull children was studied by MacMurray (42). He compared the intelligence of gifted children and of dull-normal children as measured by the Pintner-Paterson and Stanford-Binet scales. The dull group showed a mean increment of 9.4 points of IQ on the Pintner-Paterson as against the Stanford-Binet, but there was considerable overlapping in IQ's obtained from the Pintner-Paterson. For the dull group the correlation between IQ's obtained in the two tests was .43 while for the superior group the correlation was .23. As pointed out by MacMurray, results such as these should give us pause when the tests are used interchangeably.

The findings in the factor analysis study by Morris (50) throw considerable light on the low correlations frequently found when the scores on verbal and performance tests are correlated. The analysis was made of thirty-four well-known performance tests which were administered to fifty-six nine-year-old boys in a New York City grade school. The interrelationship among the tests ranged from moderately high positive to a

moderately high negative relationship. The presence of one general factor was not disclosed but three group factors or abilities were rather clearly indicated. These were identified by Morris as being similar to the Spatial, Perceptual, Speed, and Induction Factors described by Thurstone. Should these findings be confirmed by other investigators it could then be demonstrated that verbal and nonverbal tests do not measure the same components of what is frequently called general intelligence. For clinical practice the implication would be that the tests should be used to supplement one another rather than interchangeably.

Measures of Particular Mental Abilities

The nature of mental abilities was brought more sharply to the attention of the practical worker by the publication of *Primary Mental Abilities* by Thurstone (70). The battery consists of sixteen tests arranged to be administered in three sessions requiring two hours and thirty-three minutes of testing time. In addition, a total of one hour and eight minutes is required for the practice exercises which precede each test. The battery yields seven scores which represent relatively independent or uncorrelated mental abilities or factors. Perception, Number, Verbal, Space, Memory, Induction, and Reasoning. Each of the factor scores is obtained by the simple addition of the raw scores of two or three tests, the score being the number right—except that in four instances it is the number right multiplied by two. A profile of the individual's standard score in each of the seven primary abilities can readily be prepared.

The number of research studies reporting the use of the new battery is as yet small. Stalnaker (62) made an extensive analysis of tests taken by the freshmen entering the University of Chicago in 1938. Most interesting is his table of intercorrelations between the scores in the sixteen tests. Where an individual's factor score was computed by adding the scores in two tests he sometimes found a very low correlation between the tests. In addition he found fairly high correlations between several of the factor scores indicating that for his population the factors were not strictly independent or uncorrelated. This investigator also expressed the belief that speed figures prominently in the scores though it is not listed as a primary factor. Some of the items were found to correlate poorly with the factor they were supposed to measure and for the most part the items were found not to be arranged in order of difficulty. In general, these criticisms are in agreement with those of Crawford (20).

Thurstone (69) pointed out that when scores in several tests are combined to give a composite measure of a primary factor, the separate tests should have low correlations. If the several tests within a composite had high intercorrelations, they might have in common not only the primary factor but also other factors not intended to be measured by the composite. Thurstone also presented facts to show that the scores as now obtained for various primary factors must of necessity be correlated. Since

each primary factor score is determined as a linear combination of several test scores and this composite score is only an estimate of the primary factor which has a sizeable saturation in each test of the composite, it follows quite naturally that such raw scores will be found to correlate positively

Despite the fact that there are defects in the present battery of Primary Mental Abilities Tests, the present reviewer is of the opinion that they represent a milestone in the measurement of human abilities. One of the foundation stones of guidance and personnel work is that individuals differ in their capacity to perform various types of tasks. Efforts to measure these abilities have lacked the precision required for practical utility. The theoretical foundations and the research underlying the construction of the Tests of Primary Mental Abilities open up new possibilities for individual diagnosis and guidance. The findings to date are not final but are promising and challenging.

Tests designed to fill rather specific clinical needs are gradually becoming more numerous. Shipley (59) developed a scale for the measurement of mental deterioration based upon the clinico-experimental observation that in such deterioration vocabulary level tends to be affected but slightly while ability to see abstract relations declines rapidly. The impairment index employed in the scale is a vocabulary-abstract thinking test of twenty completion items. Each test has a ten-minute time limit. Standardization for mental age was based on a group of 1,046 normals. Extensive evaluative data are not yet available.

Cattell (19) recently described a culture-free intelligence test which he believed suitable for measuring the intelligence of widely different racial and cultural groups. The seven subtests are all perceptual in character, but Cattell pointed out that they have consistently manifested high "G" saturations in the work of earlier investigators. The directions can be given in pantomime if necessary, thus eliminating or reducing the effect of a subject's knowledge of language upon his score in the test. Many persons upon examination of the tests will argue that all aspects of an individual's intelligence will not be sampled by the test exercises. Cattell believes that most of the higher-order mental processes can be measured by means of perceptual tests. Further research should decide the relative merits of these two points of view.

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CHAPTER III

Applications of Intelligence Tests¹

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TWO KINDS OF applications of intelligence tests are discussed in this paper: (a) those of a research character in which tests are used in studying the various conditions and correlates of intelligence, and (b) those of a more practical nature in which tests are used in the interest of selection and prediction. The more detailed studies will be presented last.

Racial Factors in Intelligence

Much of the confusion of tongues in respect to racial differences in intelligence undoubtedly stems from differences in meaning of the terms intelligence and race. In an ethnological sense a racial characteristic is one that is transmissible by descent and is thus independent of the cultural environment in which individuals are reared. It may very well happen, and does, that some characteristics of races are not racial, at least when *racial* is used in an ethnological sense. Thus the assertion that one characteristic of the American Negro is low test intelligence need not imply that this characteristic of a race is truly a racial characteristic. It may be a cultural one; which would mean, if true, that when put on a par in opportunity with white Americans the Negroes would also be on a par with them in test intelligence. Investigations show favorable comparisons between white and Negro children when they are thus matched economically and educationally—which may be due to selective factors. The fact remains that Negroes as a whole are by no means on a par with white children in these respects and that as a whole they are not on a par with them in test intelligence.

Performance on intelligence tests is not the only respect in which Negro children display less intelligence than white children. For example, they learn less readily, a fact that is itself predictable from their inferior test intelligence. These are simple statements of fact. It would be a mistake, however, to conclude that these differences are racial simply because they are characteristics of a race.

Jenkins (43) maintained that inasmuch as white and Negro groups under comparison have not generally been equated as to environmental and cultural background, the comparisons are invalid. Invalid, with respect to what? Possibly, though not certainly, invalid to show the presence of racial differences, but not invalid to show differences between races. Attention is called also to a recent article by Hollingworth and Witty (37). This article and the one by Jenkins (44) reported the results of a rather extensive

¹ Bibliography for this chapter begins on page 36

search for superior intelligence among Negro pupils. Evidence accumulated for a score of years tended to show that from 20 to 25 percent of the Negro population equal or exceed the median test intelligence of the white population (24). In a sampling of 8,000 Negro children they found 1.23 percent to earn Stanford-Binet IQ's of 120 or above. According to the best available data, approximately 8 percent of the white children equal or exceed this figure. By finding the best value of the mean and SD of the IQ of Negro children from the published literature, one could predict quite reliably the percent that would have IQ's at or above 120 or any other IQ value.

In a survey of the DuSable High School (Chicago) Beckham (4) found by the Henmon-Nelson tests that according to Terman's classification 1.5 percent were mentally defective; 10.2 percent, borderline; 37.0 percent, dull; 44.2 percent, average; 5.4 percent, above average. Two percent earned IQ's above 120. Hu (40) found a slight superiority of 116 Anglo-Chinese children of Liverpool and London over English children of comparable schooling and socio-economic status.

Family Factors

Size of family—Inasmuch as a positive correlation obtains between occupational rating and test intelligence, and a negative correlation between occupational rating and birth-rate, we may infer that test intelligence is negatively correlated with birth-rate. According to Penrose's data (77), there are 4 children, on the average, born to families of unskilled occupational classification and 2 to those of professional classification. Roberts (89) tested all of the children between nine and thirteen years of age in the city of Bath. A correlation of $-.23$ was obtained between IQ and the number of children in the family. He reported that the infertility of the gifted poor equalled that of the gifted rich. Cattell (15) estimated, from sociological data, that there has existed an inverse relationship between social status and fertility since at least 1870 in Britain and 1890 in America. Moreover, "When an allowance for environmental handicap in test performance has been made, rural groups, both in America and Britain, average about 5 points of IQ lower than city groups. Their fertility is greater." Various investigations in Britain and America have yielded coefficients of the following magnitude between test intelligence and fertility: $-.33$, $-.27$, $-.30$, $-.25$, $-.19$, and $-.34$.

Moshinsky (71) studied the relationship between fertility and test intelligence in offspring in the case of about 10,000 children with fairly homogeneous socio-economic groupings. While he found a low negative correlation between fertility and test performance, the magnitude of the coefficients is greatest for the middle class. In fact they lack statistical significance for the samplings drawn from the poorest and most prosperous sections. Willoughby (113) found no relationship between the test intelligence of college women and the number of living children, for a class having graduated in 1927.

Parent-child relationships—With tests which, in comparison with the prevailing ones, are relatively culture-free, Cattell (14) found a correlation of .91 between test intelligence of mid-parent and child. The reader will recall that $r = .50$ is customarily taken as the amount of relationship to be expected of parent-child performance. Willoughby (112) obtained a coefficient of .51 between father and son-daughter scores and of .55 between mother and son-daughter scores. In a recent article Conrad and Jones (20) reported a correlation of .49 between parent and offspring Stanford-Binet scores, and of .49 between parent and offspring Army Alpha scores, 997 individuals, 269 families being represented. An average correlation of .49 is also reported between sibling pairs.

Age of parent—The relation between parental age at time of birth and the test intelligence of the offspring was treated in a recent article by Punke (83) with respect to college women. It is found, for example, that of the entering freshman who earned less than an average rating on the psychological examination, 58 percent had fathers no more than 30 years older than themselves, 67 percent had mothers no more than 25 years older than themselves. Of those in the upper half on the psychological examination, 46 percent had fathers no more than 30 years older than themselves; and 50 percent, mothers no more than 25 years older. In performance on English, mathematics, social studies, and science, the differences are generally greater than they are on the psychological examination. It should be said, however, that data such as these do not prove that it is more favorable to be born of fathers over thirty and mothers over twenty-five than of younger parents if reference is made to the same parents. Certainly one could not justify from these data the recommendation that parenthood should be delayed until these ages have been passed. The number of uncontrolled factors could be reduced by comparing children within the same family, as in the studies of order of birth.

Birth Factors

Prematurity of birth—For seventy-eight children who were born prematurely, Benton (5) found no evidence of adverse effects on test intelligence at preschool ages. No relationship was indicated between weight at birth and test performance at preschool age.

Seasonal variations—The reader will recall that certain investigators, MacMeeken (64) and Pintner and Forlano (78), have obtained evidence of a very slight association between IQ and the month of birth. Children born in a warm month have 1 or 2 IQ points' advantage over those born in a cold month, February being the least favorable and September the most favorable. Fialkin and Beckman (25) observed the same phenomenon in a sampling of about 3,000 adults. Pintner and Forlano (79) have compiled data gathered from various sources in the southern hemisphere. The results tend to show a very slight advantage, about 1 IQ point in favor of those born in warm months.

Socio-Economic Status

Upon the basis of an extensive survey of the literature pertaining to socio-economic status, Loevinger (59) concluded that the correlation between the test intelligence of children (ages three to eighteen years) and the occupational ranking of their fathers may be represented by the value $r = .4$. She found no evidence of a positive correlation between these two variables in the case of children under eighteen months of age. Honzik (38) obtained negligible coefficients between test scores of children and socio-economic index and education of parents in the case of children between 21 and 36 months of age. At three and one-half years of age a mean coefficient of about .25 was obtained. The magnitude increased somewhat for successive yearly examinations up to age seven, at which age the mean coefficient stood at about .40. This phenomenon may, of course, be due in part to the unsatisfactoriness of the tests of intelligence at the lower age levels. Loevinger (59) estimated from her review of the literature that the average intelligence test achievement of the children who came from the highest occupational group was one standard deviation above the mean, and that of those from the lowest occupational group was one-half standard deviation below the mean. These correspond to IQ values of 116 and 92, respectively, taking 16 as the SD of the IQ. In an analysis of the intelligence test scores of University of New Mexico from 1921 to 1936, Haught (31) found the mean scores to rank according to fathers' occupations, in descending order, as follows: professional, business and clerical, skilled, semi-skilled, and unskilled.

A comprehensive summary of the investigations on the test intelligence in backward communities has been published recently by Mann (68). Similarly, Neff (72) supplied a summary of the investigations of the relationship between socio-economic status and test intelligence. A recent article by Bayley and Jones (3) also furnished pertinent data.

Ball (2) correlated Pressey Mental Survey IQ's derived in 1918 and again in 1923, when the subjects were distributed from Grades II to X, with occupational status attained in 1937. A correlation of .71 was found between the 1918 Pressey scores and 1937 ratings of occupational status by the Barr scale. Between the 1923 Pressey scores and the 1937 ratings the correlation was .57. Clark and Gist (19) obtained about the same relationship between test intelligence and occupational choice of high-school pupils as that which obtains between the test intelligence of pupils and occupations of their fathers.

Personality, Behavior, and Intelligence

In a review of the literature Lorge (60) compiled a list of over two hundred correlation coefficients. One-half of these range in magnitude from .00 and .15, and one-fourth are above .30. Wile and Davis (110) found

that competency of social adjustment is inversely related to the disparity between chronological age and basal age. They also compared the behavior of one hundred children having IQ's from 120 to 148 with the behavior of an equal number of children having IQ's from 50 to 79. Infantilism and regressive emotional and social behavior were more frequent among the superior; disturbing behavior at home, maladjustment at school, and inter-sibling conflicts, among the inferior (109).

Delinquency—A. W. Brown and Hartman (10) reported the results of routine testing of adult male prisoners in Illinois for the years 1930-1936 ($N = 13,454$). Bregman Alpha and some Stanford-Binet and Arthur Performance scores were obtained. As in previous surveys, the test intelligence of the prisoners distributed about as that of the army draft, with a disproportionate number of low scores. Williams (111) surveyed the literature on juvenile delinquency and found average IQ's ranging from 79 to 90 reported for different populations. Since juvenile delinquency is negatively correlated with socio-economic status, something of this general tendency should be anticipated. The test performance of delinquents is roughly of the same order as that of nondelinquents of the same socio-economic status.

Constancy of Mental Test Performance

Recent investigations have shown that the constancy of mental test performance increases with age during the preschool period. This work was summarized in a recent article by Honzik (39), whose own investigations are confirmatory. Predictions made from test performance upon single tests are found to be especially unreliable when the tests are administered before the age of two years. The data of Nelson and Richards (73,74) are capable of the same interpretation. In the case of 72 children they obtained correlations of .37 between performance on the Gesell items administered at age six months and the Merrill-Palmer Test administered at age twenty-four months, and of .46 between the Gesell items (age six months) and the Stanford-Binet Test administered at age thirty-six months. In a later article (80 cases) a coefficient of .56 was reported between the Gesell test administered at age twelve months and the same test readministered at age eighteen months. The Gesell test administered at age twelve months correlated with the Merrill-Palmer at twenty-four months to the extent of .32 and at thirty months, .35; and with the Stanford-Binet at 36 months, .33.

The reader will recall that coefficients in the neighborhood of .90 are readily obtainable between IQ's derived several years apart in the case of children of school age. It is not known, at least to the writer, whether the relative inconstancy of test performance at the younger age levels is due to the inconstancy of mental development at these levels or to the inadequacies of the mental tests

Effect of Environmental Factors

The proponents of nature and nurture have squared off anew under the impetus of the Thirty-Ninth Yearbook of the National Society for the Study of Education which, aside from the nature-nurture issue, is a competent work on test intelligence and its correlates. No radically new weapons of warfare are introduced. We read about twins, nursery school influence, and foster-home placement, as during the last ten or fifteen years.

In a few scattered investigations increments in IQ have been associated with nursery school attendance. Others have denied that any such thing happened in their nursery schools. It is not clear why anyone should believe that the nursery school should *per se* have any special IQ-raising properties. It is at least understandable how such an institution might produce this effect under certain conditions, the most important probably being whether the nursery school represents a marked improvement over the kind of environment the child has lived in up to the time of matriculation. The writer is not maintaining that such a contrast has or will enlarge the IQ; in fact, examination of the published research fails, on the whole, to give any great promise. The paper of Reymert and Hinton (86) represents a step in the right direction. The background of each of their cases (for the most part children of school age) prior to their entrance into "a relatively superior environment" was fairly well known.

Of the eleven articles in the Thirty-Ninth Yearbook of the National Society for the Study of Education that present research bearing directly upon the effect of nursery school attendance on the IQ, seven—Anderson (1), Bird (6), Goodenough and Maurer (29), Jones and Jørgensen (45), Lamson (52), Olson and Hughes (76), and Voas (105)—gave negative results, four—those of Frandsen and Barlow (possibly) (26), Kephart (46), Starkweather and Roberts (99), and Wellman (107) gave positive results. (See also an article by Skeels and others (95).) This gave the *status quo*. It is not to be supposed that important psychological problems can be settled by simple addition. One experiment of the right kind may be more definitive than a dozen poor ones. Research on the effect of nursery school education upon the IQ cannot be expected to contribute much to the nature-nurture issue except in instances in which tenure in such a school represents a wide, definable, and clearly known discrepancy in educational opportunity as between the home and the school.

The papers of Skeels (93, 94) and Skodak (96, 97) presented a promising procedure in studying the effects of foster-home placement. About 150 infants of illegitimate parentage and under six months of age were placed in superior adoptive homes. Periodic mental examinations, the last one made when they had attained the age of approximately four years, indicated a level of performance such as would be expected of children born in homes of similar status. About half the true mothers were examined and found to test low, a condition normally to be expected. Hasty generalization is ill advised. However, these are the most favorable investi-

gable conditions that have as yet been found; here, if anywhere, we should expect a good environment to make itself felt. Experience may be expected to refine the details of the procedure. As future experimentation goes on, this is a kind of approach that should be watched. The reader's attention is called also to an article by Wells and Arthur (108) on the effect of foster-home placement.

This discussion closes with a quotation from Carter (13) as he summarized his article: "The whole array of twin-studies seems to suggest, to the writer at least, the futility and artificiality of the idea of untangling nature and nurture influences in the sense of ascertaining the percentage contributions of each in any *general* sense."

Intelligence Test Performance and Academic Achievement

Bruce (12) obtained a correlation of .31 between the IER Intelligence Scale CAVD, Levels M, N, O, P, and Q, and point-hour ratios earned by 440 master's degree students at Colorado State College of Education. The mean point-hour ratio of the lowest 25 percent on the CAVD was 3.72; that of the highest 25 percent, 4.25. This was found to be a statistically reliable difference, although there may be some question about the legitimacy of using PE and SE formulae in tests of significance of differences between truncated distributions. Of 589 freshmen engineering students, 63 percent of those placed in deciles 8-10 by the American Council Psychological Examination received a letter grade of A; 10 percent of those placed in deciles 1-3 received this grade, as reported by McGehee (62). Within the years 1931-1934 Wesleyan University freshmen were given various scholastic aptitude tests. Letter rating from A (top 10 percent) to E (bottom 10 percent) were assigned to the scores. The following proportions of the original groups were graduated at the end of a four-year period: A, 82 percent; B, 83 percent; C, 60 percent; D, 39 percent, E, 31 percent. Of the A group 3 out of 5 men were graduated with honors, 1 out of 20 of the E group attained like distinction. These data were reported by Langlie (55). In addition, the reader's attention is called to investigations by Kirkpatrick (48) and Rigg (87).

Prediction of School Success

The following studies are pointed especially toward prediction of school success, mostly college. Those cited in the preceding section are, of course, pertinent to this topic. A comparison has been made by Prescott and Garretson (82) between an intelligence test and teachers' ratings, with respect to correlation with first semester college grades. The teachers' estimates correlated .63 with grades; the intelligence test, .32. Keys (47) obtained a coefficient of .35 between Terman Group IQ's earned by students in junior high school and their eventual grade-point averages in college. Those of the group who entered college had earned an average IQ of 115.5; those who graduated, 118; those who graduated with honor, 125.

Leaf (56) reported a correlation of .57 between average college freshmen marks and the American Council Psychological Examination, for 97 students; a correlation of .56 between marks and the Iowa High School Content Examination scores; and of .74 between marks and high-school marks. From a regression equation he predicted college marks and obtained an r of .77 between the predicted marks and actual marks. A coefficient of multiple correlation of .79 was reported. Attention is also called to the articles by: Charters (17), Langlie (55), Manning (69), Nemzek and DeHeus (75), Quaid (84), Read (85), and Traxler (104)

With respect to adult education Brody (9) examined the claims that have been made by certain writers to the effect that educational achievement is more highly correlated with test intelligence than with the number of years of previous formal schooling. He maintained that a revaluation of the data tends toward the conclusion that the two factors are equally related to adult educational achievement.

Two simple facts should be kept in mind in connection with the attempts to predict college marks from the intelligence test scores of high-school pupils or from any other such data. One is the unreliability of the college marks. The other is that college students are drawn very largely from the upper half of the high-school population, thus eliminating many potential failures—and also reducing the coefficients of correlation which are obtained

Relations between Test Intelligence and Various Factors

Photographs—Cook (21) obtained coefficients of correlation ranging from -06 to $+020$ for various judges (personnel managers and social workers), between intelligence test performance and estimates of intelligence from photographs. The photographs were uniform in quality, the subjects, college men (freshmen).

Knowledge—A study of the relationship between test performance and knowledge of world affairs of high-school pupils was reported by Blair (7). An r of .58 is given. The relationship did not change appreciably when fathers' occupations were held constant. Kohn (49) obtained coefficients of from .54 to .82 between scores on various intelligence tests and scores on the Sones-Harry High School Achievement Test. A correlation was reported by Inman (41) between Otis MA's and scores on a general knowledge test of .45, and of .41 between schoolwork and general knowledge. Watson (106) has studied the relationship between intelligence test scores and retention of course material.

Musical talent—Correlations of from .12 to .26 between test intelligence and achievement on the Seashore Test of Musical Talent for 1,541 pupils, Grades V to XII, and of from .09 to .23 between Stanford Achievement and the Seashore scores were obtained by Ross (90).

Improvability in reading—McCullough (61) found no relationship between test scores and response to remedial instruction at the high-school and freshman college level, pursuant to a 10-week instructional program. Twenty-four high-school and forty-nine college students were studied. It is a question whether any significant improvement in reading can be effected in so short a period. Moderate gains, however, were indicated here, moreover, the results do not seem to be due to the regression effect as do those of some investigations in work of this kind

Physiological Correlates of Intelligence

Metabolic rate—For two hundred children, ages six to fifteen, Hinton (35) obtained a correlation of .71 between basal metabolic rate and Binet IQ's, and of .74 between the same variable and Arthur Point-Performance Scale IQ's. These findings corroborate those of a previous investigation conducted by the same author in which for 90 children coefficients of .74 and .66 respectively were obtained between basal metabolic rate and the same two intelligence tests (36). The first-named article gives separate correlations for each yearly age group. A marked and, to some extent, progressive decline in the magnitude of the coefficients begins at age ten. The author stated that this finding is in agreement with the fact that for adults there is no connection between basal metabolic rate and test intelligence. Investigations by Shock (92) and others have yielded much lower correlations than those reported by Hinton, being of the magnitude of .20 to .30.

Diabetic condition—A review of the literature and an examination of six cases by herself led Teagarden (103) to conclude that diabetic children give no evidence of intellectual superiority. On the contrary, there is some evidence of inferiority on their part. This observation is in line with G. D. Brown's findings (11). The latter found that diabetic children tested slightly below their siblings, although the sampling was too small to be dependable. Some of the early work had given evidence of some superiority upon the part of diabetics.

Effect of drugs—Molitch and Eccles (70) obtained gains of 7, 12, and 15 percent in certain mental tasks subsequent to the administration of 10, 20, and 30 mg's of benzedrine sulfate respectively to three small groups of boys. Three matched control groups gained 3, 8, and 13 percent pursuant to the administration of an indifferent drug. The smallness of the net gain of the experimental groups over the control groups gives little support to the claim that the drug has a psychologically stimulating effect. This finding is in accord with results of McNamara and Miller (65). A stimulating effect of cobra venom upon both speed and accuracy of intellectual performance has been obtained, in the case of 25 college students, by Macht and Macht (63). They also found that morphine, codein, dilaudid, and heroin reduced the speed of mental processes.

Allergic condition—Chobart and others (18) in studying 169 allergic children found no association between this condition and test intelligence—which, they assert, is contrary to popular prediction.

Rachitic children—Halleran (30) found a reliable difference between rachitic and nonrachitic children in rate of mental development, the advantage being in favor of the latter. In the verbal elements in the tests no differences were observed. The author suggested that the retardation noted is probably the result of significant motor retardation.

Brain extirpation—Hebb (32) administered the Stanford-Binet and 2 performance tests to four subjects who had undergone frontal lobectomy, the levy probably amounting to from 4 to 10 percent of the total cerebral mass. Three tested above normal, one somewhat below normal, after recovery. In one case in which pre- and post-operative tests were administered, no important changes in test performance were observed. The results are taken to signify that the effect on test intelligence of frontal lobectomy, of the amounts involved, is at least not great. This observation is in accord with other findings, for example, those of Jefferson (42). A brief review of the literature is found in a recent article by Erickson (23).

Electroencephalography—It is generally observed that the frequency of the *alpha waves* and the percent of time they are present increase with chronological age up to about the tenth year, at which age they assume adult characteristics. In studying certain types of feeble-minded adults, ranging in mental age from 1.5 to 75 years, Kreezer (50) obtained evidence of a correlation between Stanford-Binet MA's and electroencephalographic phenomena. The magnitude of the *r*'s varied with different classifications of feeble-mindedness. The latter could well be accidental owing to the smallness of the samplings, the smallest group containing 13 cases, the largest 50. Lindsley (57) did not fully confirm Kreezer's general findings and is inclined to believe that the fact of a correlation between EEE phenomena and MA, CA being constant, has not been fully established.

Sex differences—A critical review of the literature on sex differences led its authors, Kuznets and McNemar (51), to conclude that the earlier and not overly well-founded predictions with respect to the absence of important sex differences in general intellectual status have been vindicated. No significant differences are indicated either in general average or in variability. It may be said, however, that in some instances test items which show a differential appear to have been eliminated in the construction of batteries. The possibility of the presence of important sex differences in performance on certain kinds of items has not been eliminated. Additional reference is made to articles by Livesay (58), Rigg (88), and Rusk (91). In the majority of the investigations boys are found to be slightly more variable, though the differences are in most instances unreliable.

Nutrition—A significant gain—an average of 10 IQ points—is reported by Poull (81) in a group of 41 children pursuant to an improvement in

nutritional status. A control group, well nourished at the beginning and at the end of the experimental period, matched with the experimental group in CA and IQ made no average change. The nutritional status of both groups was determined by physicians' examinations and hospital records. It is suggested, tentatively, that a period of from eighteen to twenty-four months is required to effect a significant change.

The Deaf and Hard of Hearing

Adequate appraisal of the intelligence of the deaf is as far from fulfillment as ever. Language tests are regarded as being very unsatisfactory and performance tests have for the most part correlated indifferently with the usual criteria of intelligence. Language tests are probably not entirely unsatisfactory. At least they make possible an appraisal of a subject's ability to utilize language in intellectual situations; and it is difficult to see how any high order of intellection can go on in the absence of language. If one has as his goal the measurement of the innate endowment of the deaf, language tests are, of course, quite inadequate. It is a mistake to assume that achievement on a language test gives a true picture of the whole mental development of the deaf but it is equally erroneous to assume that a performance test score of a deaf subject gives an adequate appraisal of his mental ability. Even though he may achieve normally on a performance test we know at once that he is handicapped in all the higher mental processes because of his lack of facility in language. It is possible that a level of achievement on a performance test has different predictive value for deaf and normal hearing children. In some respects it is probably less meaningful in the case of the deaf.

Bridgman (8) wrote: "So far, we have not found one deaf child who, having failed badly on a scale of nonverbal tests, was able to make even fair progress in his schoolwork. On the other hand, there was a considerable portion of deaf children in the group tested (17 out of 83), who showed normal and at times very superior ability on the nonverbal scales, but whose success in school subjects was no better than that of frankly mentally deficient children." It is true, however, that other complicating factors, such as poor home background and behavior difficulties, were present. Zeckel and van der Kolk (114) found a group of one hundred congenitally deaf children to rank below a group of one hundred hearing children, matched in socio-economic status with the deaf, by about 10 Porteus Maze IQ points. In efforts to appraise the mental ability of deaf children it would be desirable also to compare the performance of deaf children with that of their siblings.

A comparison was made by Pintner and Lev (80) of the performance of 1,556 children having normal hearing with that of 1,404 hard-of-hearing children on verbal and nonverbal tests. The mean verbal test IQ of the normal hearing children was 101, that of the hard-of-hearing, 95,

and that of the very hard-of-hearing, 92. On nonverbal tests the IQ's were 102, 99, and 99, respectively. Springer (98) obtained no significant differences between the scores of 330 deaf and 330 hearing children (ages six to twelve years) on the Goodenough test (drawing a man). The reader's attention is called also to an article by Lane (53).

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CHAPTER IV

Measurement of Aptitudes in Specific Fields¹

DAVID SEGEL

IN THIS DISCUSSION the word "aptitude" is used in two ways—one as a measure of a special ability (for example, the measurement of visual acuity), and the other as a prognostic measure (for example, the use of a special test to forecast success in an occupation). The chapter will not cover all measures of these types since educational tests are dealt with in other issues of the REVIEW and another chapter of this issue covers certain applications of intelligence tests.

General Treatises of Vocational Aptitude

O'Rourke summarized the literature on vocational aptitudes from 1935 to 1937 in the June 1938 issue of the REVIEW (88). Since that time several general evaluations and discussions have appeared. Most important was the one by Stead and others (109) which discussed research methods in occupational prognosis and gave results in the testing of aptitude for several specific occupations. The study described the technical activities of the Work Analysis Section of the U. S. Employment Service, which developed measures of proficiency for people already in occupations. Oral trade questions in 126 occupations have been developed.

One limitation in the use of the results of these studies is that the tests have been ratified for specific occupations rather than for individuals seeking guidance, and the test batteries are therefore employment tests rather than general guidance tests. An employment test is one given by a prospective employer to see if a specific applicant has the requisite ability. A guidance test is a test which will help the individual determine what type of occupation he is best fitted to enter. An inspection test of the type described by C. A. Drake (26) is a good prognostic test for inspectors of metal piecework but it has no known value as a guidance test. A mechanical aptitude test on the other hand has some guidance value but is not a specific employment test. Some tests may be useful for both purposes, for example, a manual dexterity test is both a guidance test and a specific employment test. Many of the tests described in the volume by Stead and others may have guidance value, but until they are tried out in a more general situation their guidance value is not known. A second limitation to this study is that the persons taking the tests were already in the occupations when tested, and some of the traits which they possessed may have been obtained on the job. Not until it can be shown that the traits are needed by *beginning* workers can the presence or absence of the trait be used as a good guide for employment.

¹ Bibliography for this chapter begins on page 52.

The interpretation of validity coefficients for guidance measures was discussed by Taylor and Russell (114). They pointed out that the validity of a score for prognosis will vary with the critical score and the percent of persons usually successful on entering an occupation. Bell (6) reviewed the relationship between adjustment scores in college and occupational intentions, while Bingham (10) pointed out the need for the accumulation of research data over a period of years for good prognosis but cautioned against believing that interests and abilities are constant. General expositions of the use of measures for determining special aptitudes as well as more general aptitudes are those by Ruch and Segel (95), and Paterson, Schneider, and Williamson (90).

Aptitude for Specific Academic Fields

The elementary field will be omitted because at that level, except for specialized tests for beginning school children, the best aptitude indicators are the achievements in the individual fields.

Several investigations of the aptitude for algebra (15, 62, 79, 99) compared the value of general intelligence, arithmetic achievement, reading achievement, and the following special aptitude tests. Iowa Aptitude Test for Mathematics, Orleans Aptitude Test for Algebra, and the Lee Test of Algebraic Ability. The conclusion reached was that the special aptitude tests are best, the arithmetic tests next best, closely followed by the intelligence tests. The other measures are distinctly less favorable as algebraic predictors. The results of these studies confirmed previous work.

Traxler (117) and Segel and Proffitt (103) made extensive investigations to establish that marks in different subjects in high school and college have differential and direct predictive value which is substantial. Stuit and Donnelly (112) found that for a differential prognosis of success for most of the academic subject groups in college, the following tests could be used: Iowa High School Content Examination, the Iowa Mathematics Aptitude and Training Tests, and the Iowa Silent Reading Tests. These results also are in accord with previous studies. Working with the College Board Scholastic Test, Dickter (21) found the mathematical parts much more predictive of college success in mathematics than was the verbal part. Greene (48) analyzed the prognostic value of mental tests, vocabulary tests, interests, and previous training for 458 students in a psychology course. He found that by using several factors a fairly satisfactory prognostic value could be obtained.

The Detroit General Aptitudes Examination (3) was developed for the first two years of high school to differentiate between aptitudes for general academic work, industrial arts, and various manual trade subjects and clerical course subjects. The materials of this test consist of motor performance, mechanical information, visual imagery, verbalization, and achievement in arithmetic, reading, spelling, and handwriting.

Interest indicators afford an indirect means of indexing aptitude for various academic subjects. Research on the relationship of interest scores to specific school courses has been mainly a development of the period here reviewed. The Michigan Vocabulary Profile Test (47) gives an indirect indication of interest in the following different types of school courses: human relations, commerce, government, physical sciences, biographical sciences, mathematics, fine arts, and sports. A study (49) of the profiles on this test for students who had chosen distinct occupational courses showed that the test distinguished between graduate nurses, engineering students, and first-year medical students, but not between business administration seniors and graduate students in education.

The Vocational Inventory developed by Gentry (45) covered vocational areas and used information rather than vocabulary. The areas covered are: social service, literary pursuits, law and government, business, artistic pursuits, mechanical designing, mechanical construction, and scientific pursuits. The value of the inventory in determining aptitude for college courses was supported by Gentry. Another measure of interest constructed by Kuder (63) can be used for both educational and vocational guidance. Its categories of interests are: scientific, computational, musical, artistic, literary, social service, persuasive. The items were made up from activities in which students might conceivably sometime engage, and are direct interest items instead of informational. The Dunlap Preference Blank was studied by Sharkey and Dunlap (106). It was found valid as an indicator of success in several different school subjects. Congdon (16) found that the Cleeton Vocational Interest Inventory was of value in differentiating between students of education and others. Duffy and Crissy (32) made a study of the relation of the evaluative attitudes—economic, political, theoretical, esthetic, social, and religious—to vocational interests and found significant trends between the two.

Musical Ability

The Seashore Tests of Music have been revised (101). Included as before are pitch, loudness, time, rhythm, and tonal memory, but a new test of timbre replaces the old consonance test. Semeonoff (104) experimented with the measurement of the appreciation of music through having students listen to ten phonograph records and select the best interpretation out of four alternates. The reliability of the tests was found to be high. Another method of appraisal of musical aptitude at the high-school level was developed in the high school of the University of California (70). Ten each of the following were used: rhythmic patterns, melodic patterns, dissonant and consonant chords, and differentiation in pitch and intensity.

Seashore (100) discussed musical theories and (102) outlined the rules for the construction of a sight singing scale. Tests of ability to sing simple

phrases were found to be more discriminative at preschool ages and reflected progress better than singing single notes or two-note intervals, according to a study made by Updegraff, Heiliger, and Learned (119). Murrell's criticism of the validity of music tests (82) has in turn been attacked by Kwalwasser (64). A study of the changes in harmonic sensitivity in children over a period of years by Farnsworth (38) showed that with increasing musical sophistication there was a tendency to brand fewer and fewer musical combinations as bad.

Several analyses of the scores on musical tests by themselves and in conjunction with scores on other tests have been made in order to find the fundamental musical traits. R. M. Drake (29, 30) made factorial analyses of the scores on the Test of Musical Memory and Retentivity, Kwalwasser's Test of Tonal Memory, and Seashore's measures of pitch, rhythm, intensity, time, and tonal memory. More than one common factor was found. It was suggested that the major one was "memory for auditory items." The five Seashore tests were not found to satisfy the criterion of division into independent measurements of isolated capacities. The relation between the intelligence test scores and scores on certain of the Drake Music Tests, the Seashore battery, the Lowery measure of cadence, and the Kwalwasser-Dykema Tests of Melodic Taste and Tonal Movement was found to be low by R. M. Drake (31). Morrow (80) found that scores obtained on tests of musical, artistic, and mechanical abilities did not show clear differentiations between the three fields. Kwalwasser (65) concluded that the correlation between intelligence and musical ability is low because of the regression effect. Larson (67) found a correlation of .59 between Seashore scores made in high school and later marks in a music school.

Art Aptitude

Varnum (121) developed an art aptitude test having exercises on color memory, tone graduations, proportioning, static balance, rhythmic balance, feeling for geometric form, and creative imagination. The subsections correlated from $-.15$ to $+.31$ with each other and from $.18$ to $.62$ with the total score; the reliability of the total test ran as high as .88 on one group. The test was validated through scores made by art students and persons in related occupations. This test is one of the most important aptitude tests developed recently. The McAdory Art Test was revised for use with such racial groups as the American Indian by Steggerda and Macomber (110). It failed in this purpose because the racial group tested (the American Indian) based its judgment on the utilitarian rather than the artistic characteristics of the objects and situations pictured. The reliability of the Knauber Art Test was questioned originally, but Moore (78) found a reliability of .90 for it in a group of 158 college students and art teachers. Burt's picture test for artistic appreciation was found by Dewar (20) to have the highest reliability and validity among several art tests.

Several studies were made dealing with the search for independent art traits. The most important of these is probably the over-all study and review made by Meier (72). He came to the conclusion that artistic aptitude rests upon the possession of six factors: manual skill or craftsman ability, energy output and perseverance in its discharge, general and esthetic intelligence, perceptual facility, creative imagination, and esthetic judgment. Other studies made in this area are those by Eysenck (37) who found some evidence for a general factor of visual esthetic appreciation; and Dewar (20) who made a factor analysis of Burt's picture test for artistic appreciation and found indications of a general artistic aptitude and suggestions of specifics. Lark-Horovitz (66) worked on the type of pictures preferred by boys and girls at different ages, while Miller (74) tried out intelligence, personality, and other measures on art students at the high-school level and found none of them to be related to dramatic ability.

Visual Acuity and Auditory Testing

The controversy over the best methods of testing the sense of sight has continued. The interpretation of the research results is complicated by certain factors, one being that eye deficiency (so-called) is not always a liability. For example, myopia proves advantageous to persons doing certain kinds of work and possibly in facilitating reading. Studies of the relation of vision to efficiency in various school, occupational, and recreational activities will no doubt reveal factors which will eventually differentiate among the procedures in testing vision in accordance with the objectives in view.

Eames (34) found that his test of acuity of vision was reliable and valid. His test was 95 percent correct when judged by an oculist's findings. Norms for various groups of students from kindergarten to college have been gathered by Betts (8) in the three efficiency slides designed for use in the Betts Telebinocular series. He reported many investigations of the use of the Betts Binocular Tests for vision in general and for specific purposes at varying age and grade levels. Hildreth and Axelson (53) adapted the Snellen E chart so as to make the testing a game for young children. At the college level, Frazier, Ogden, and Robinson (43) found that the Betts Tests of Binocular Skill were not reliable enough for diagnostic work. Molish and Reese (76) gave the Betts Test of visual efficiency and sharpness of image to 69 college students and then tested them in an optometric clinic. In several cases those failing to pass the Betts tests showed acuity of 20/20 on the Snellen test letters, while others who passed showed less than 20/20.

On the elementary-school level, Oak and Sloane (85) concluded from using the Betts Visual Sensation and Perception Tests and checking with an ophthalmologist that the Betts tests sorted out far too many children for ocular attention while at the same time they missed some children needing attention.

Oak (84) compared one hundred pupils less than sixteen years old, handicapped in reading, with one hundred pupils of the same age, showing no handicap in reading, on the results of testing with the Betts cards (D B Series) and on examinations made by an ophthalmologist. He concluded from his findings that the Betts cards do not serve to screen out children who should be referred to an eye specialist. English and others (35) tested 485 third-grade children with the Betts telebinocular method and the method described in the report of the joint committee of the N E A. and A.M A. (83). The results indicated that the latter method was superior to the former. The higher error in the Betts method was attributed to failure to detect myopics. The relation of the measures obtained from the Betts Tests of Visual Sensation and Perception and Ives Test of Acuity and Ametropia to reading speed for students at the college level was found by Stromberg (111) to be insignificant. The work of Hitz (55) and Schwartz (97) also indicated the inadequacies of the present instruments to deal adequately with the testing of vision in the schools. The special testing of the change or adjustment of sight for changes of intensity of light and ability to change from looking at near objects to distant objects and vice versa, such as is required of airplane pilots, has been described by Ferree and Rand (39, 40).

A comparison of tests of color blindness was made by Philip (91). He found correlations of from .50 to .90 with 42 cases of defective color vision between the following tests: Ishihara, Edridge-Green, Nagel, Holmgren wools, Philip color perception, and the new edition of the Ishihara. The Ishihara and the Philip tests had certain advantages. Philip (92) also established that errors in distinguishing colors were made more frequently by boys and men than by girls and women.

Hearing—The efficiency of most of the several types of hearing tests in current use was tested and discussed by Holmgren (57) while Silverman (107) investigated thoroughly the 4-A and 2-A individual audiometer. The 4-A audiometer was found inadequate in that all the elements of English speech were not included and the 2-A individual audiometer was inadequate because it was not calibrated finely enough to insure a complete picture of the child's hearing loss. An analysis of the World's Fair hearing tests by Montgomery (77) verified the general findings of hearing in regard to age and sex.

Mechanical and Manual Dexterity Tests

In this section is included a discussion of studies of manual, motor, and physical aptitude, as well as those of mechanical aptitude. It is hoped that a new and better classification of these different traits will soon be attempted. As mental and physical traits are more clearly defined the tests will tend to fall into correct categories.

Packard (89) found that mechanical aptitude in pupils of high-school age could be measured best by a combination of (a) intelligence, (b) aca-

ademic achievement, (c) grade level, (d) mechanical ingenuity, (e) coordination, (f) manipulation, (g) spatial perception, and (h) construction. A different approach to the same problem was offered by Harrell (51) who made a factorial analysis of mechanical ability tests including the Minnesota battery of mechanical tests, the MacQuarrie Test of Mechanical Ability, the O'Connor Wiggly Blocks, and the Stenquist picture-matching test. He found five factors present—perceptual, verbal, youth, manual agility, and spatial. More evidence as to the multi-trait nature of mechanical aptitude was presented by Slater (108) who found that valid tests of this aptitude were saturated with spatial relationships. Hayes and Drake (52) found no relation between results of the MacCauley Tetrahedron Test and ability in descriptive geometry.

The motor performance of 80 girls and 85 boys was followed over a period of years by Espenschade (36). Correlations between motor performances and all measures of physical growth and maturity were low for girls but the reverse was true for the boys. Intercorrelations among motor performances were all positive but varied in magnitude. O'Connor (86, 87) gathered further norms on his Block Cube and Finger and Tweezer Dexterity Tests. Van Der Lugt (120) developed a series of tests for the study of motor functions consisting of speed of performance in (a) threading of beads, (b) punching holes in a sheet of paper, (c) pressure sense, (d) precision, and (e) motor memory. Other studies in which norms were developed for achievement scales in physical activities were those by Metheny (73), McCaskill and Wellman (69), Powell and Howe (93), Glassow, Colvin, and Schwarz (46), and by several Wellesley graduate students (115). The distribution of hand usage dextrality was further developed during this period by W. Johnson and others (60, 61).

Manual Semi-Skilled and Skilled Trades

C. A. Drake and Oleen (28) believed it possible to select with high efficiency employees for factory type work. Evidence confirming C. A. Drake and Oleen's optimistic analysis is found in a study by Hiscock (54) in England; testing situations like the actual work were used to select workers. Similar results were found in Sweden by Anderberg and Westerlund (2) who constructed a miniature weaving machine for use in securing a measure of textile learning rate. C. A. Drake (26) used a twisted rod inspection test, a pin board test, and a paper and pencil design test with success in the selection of inspectors of factory work. Tiffin and Greenly (116), however, found that the Keystone Visual Safety Tests, a hand movement test, and the O'Connor Finger Dexterity Test had little validity individually in testing aptitude for simple manual factory operations. A combination of the three produced a validity coefficient of .60. A maze test was found useful in discovering aptitude to follow electric wiring patterns (94).

The foregoing tests are known as employment tests since they are directly related to a particular job. In an attempt to find tests which might be useful in the discovery of persons with an aptitude for larger areas of skill, Slater (108) and Holliday (56) found that ability in various space and form relationship tests was basic to aptitude in the mechanical trades. They found no evidence, however, of a special mechanical aptitude such as is given by scores on "mechanical aptitude tests." They concluded that "mechanical aptitude tests" measure to some extent spatial relations and also general intelligence.

Clerical Aptitudes

The new Turse Shorthand Aptitude Test (118) was constructed from tests of manual dexterity, spelling, phonetic association, symbol transcription, word discrimination, dictation, and word sense. Hales (50) gave the Minnesota Vocational Test for Clerical Workers and Thurstone Examination for Clerical Workers to 129 inmates of a Minnesota reformatory for men who were studying clerical subjects or doing clerical work. The correlations of the test results with the supervisors' ratings were low—averaging about .35. Davidson (18) made an evaluation of the following clerical tests: Bureau Test VI, Thurstone Clerical Test, a modification of the Thurstone Clerical Test, Minnesota Vocational Test for Clerical Workers, O'Rourke Clerical Aptitude Test—Junior Grade, O'Rourke Clerical Aptitude Test—Senior Grade. He compared the results of the tests with supervisors' estimates and with promotability as indicated by the level of job attained at the end of a given period of employment. The validity coefficients, in terms of supervisors' ratings, ranged from .27 to .44. The validity coefficients, in terms of promotability, ranged from .07 on the number checking part of the Minnesota test to .77 on the O'Rourke Clerical Aptitude Test—Senior Grade. This kind of validity is limited by the fact that the testing was done on persons already working in the clerical field. The high standing of the O'Rourke Clerical Aptitude Test can more easily be attributed to the training received on the job than to inherent aptitude. Stead and others (109) reported fifty-one validity correlations for tests in a number of clerical occupations. The criterion of success in most cases was a direct production record rather than supervisors' ratings. The coefficients ranged from .35 to .68, two-thirds of them being below .50. The limitation of the method involved in deriving these validity coefficients is the same as for those quoted for Davidson.

Professional and Semi-Professional Pursuits

Dwyer (33) made an analysis of 19 occupational scorings of the Strong Vocational Interest Test given to 418 students entering medical school and found that the scores yielded for four "key" occupations—physicist, jour-

alist, minister, and life insurance salesman—explained most of the scores on the 19 original occupations. Regression equations using the scores for these four “key” occupations predicted scores for most occupations with multiple correlations of .80 or better. A study of the variation in types of ability in relation to the type of institutions was made by Bryan and Perl (14). They tested women students in the Pratt Institute (an art school), the Institute of Musical Arts (a school of music), and New College of Columbia (an undergraduate school of education), with the Bernreuter Personality Inventory scored for neurotic tendencies, a test of rote memory, a motor speed test, and the American Council Psychological Examination. The students in the three different colleges were significantly different in some of the traits.

Dentistry—A battery of 34 items used for selecting dental students was described by Bellows (7).

Education—Successful educators were found to be superior in intelligence by Shannon (105). However, Shannon studied administrators and supervisors with teachers, and judged success by promotability which is perhaps more of a measure of executive ability. Barr (4, 5) and Mathews (71) analyzed the relation of teachers’ scores on a large number of tests to changes in achievement in their pupils. None of the measures proved very significant. The two found to be of most value were the American Council Psychological Examination and Yeager’s Scale for Measuring Attitudes toward Teachers and the Teaching Profession. These studies like many others on the adult and college level suffer from attempting to interpret ability on the job as aptitude for the job.

Engineering—Laycock and Hutcheon (68) gave 144 students of the freshman engineering class a number of tests during their freshman year. The results were correlated with the average grades obtained during that year. The following correlations were obtained: American Council on Education Psychological Examination, .34; last-year high-school grades, .61; Cox mechanical aptitude test (models), .16; a paper formboard test, .25; physical science interest (Thurstone), .26. By careful selection of these tests a multiple correlation of .66 with the criterion was obtained.

Medicine—Most of the studies (12, 22, 24, 81) carried on with the Moss Medical Aptitude gave results supporting the view that it is superior to any other methods in the selection of medical students. Marks in premedical education, however, have also been found of value.

Nursing—Williamson, Stover, and Fiss (123) determined that a comprehensive testing program consisting of (a) a college aptitude test (vocabulary), (b) the Moss Nursing Aptitude Test, (c) the Cooperative English Test (usage and spelling), and (d) a Cooperative General Science Test, was a fairly valid measure of aptitude for nursing. Williamson also made some pertinent observations regarding the effect of varying marking and rating systems in different nursing training schools upon the validity of coefficients. Garrison (44) studied the relation of the scores on the Bern-

reuter Personality Inventory to ratings on student nursing practice. He also used the Otis Intelligence Test, the Detroit Mechanical Aptitude Test for Girls, and the Iowa Reading Test. Correlations of these measures with nursing practice ratings were .59, .37, and .55.

Miscellaneous

Biesheuvel (9) found that perseverators had a lower threshold for flicker than nonperseverators. In the ability to recognize faces, Howells (58) found some indication that women were superior to students and farm people and that fraternity people were superior to nonfraternity people. The validity of the Noll Test of Scientific Thinking was tested by Blair (11) by using the test taken by recognized scientific authorities. The results showed the validity of the test to be questionable. The use of the lie detector as an accurate measure was questioned by Forkosch (42) and Ruckmick (96). The latter found in a series of investigations that the detector was only 83 percent correct.

Salesmanship—A study of the factors making for success in sales work was made by Mitchell (75). He found that a vocabulary test, a word association test, a word series test (giving the names of as many things that begin with "s" as possible in one minute), and an ink blot test were of some significance. Wallace and Travers (122) also worked on this problem. They found that specialty salesmen were highly obsessional. It is, of course, another thing to say that such a trait is necessary before entering into employment. Dodge (23) concluded that social dominance is not associated with sales ability because he found a correlation of only $.16 \pm .16$ between this trait and success in selling. This conclusion is contrary to the previous work in this area.

Aviation and automobile driving—The Waltring Rotoscope, the Keystone Tel-Eye-Trainer and Stereoscope, and the American Optical Master Model Stereo-Orthopter were used to advantage in the testing and training of aviators according to Schwichtenberg (98). Swope (113) prepared a test dealing exclusively with judgment factors in automobile driving. The selection of the items was made on the basis of opinions as to the value of the item obtained from commercial and noncommercial drivers and a cross section of university students. Allgaier (1) analyzed the results of 15 tests administered to 22,000 drivers in 70 cities and found that the abilities required for safe driving were most highly developed between the ages of twenty and forty. Other testing programs for automobile drivers were described by C. W. Brown and by others (13, 19, 41, 59). C. A. Drake (27) concluded that accident-proneness is associated with the discrepancies between perception and motor reaction and that the discrepancies can be determined by tests. If Drake's conclusion is sound it means that automobile drivers could be made aware of their weakness and industrial workers placed in jobs with due regard for their accident-proneness.

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CHAPTER V

Current Construction and Evaluation of Personality and Character Tests¹

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THIS CHAPTER is concerned with the construction and evaluation of tests of personality and character. Projective methods are reserved for the following chapter, and survey studies appraising the personality and characteristics of various groups are reported in Chapter VII. The present chapter falls naturally into six divisions: (a) adjustment inventories and questionnaires for broad aspects of personality; (b) interest inventories and checklists, (c) investigations of attitudes and opinions; (d) measurement of persistence; (e) investigations concerned with rating scales; and (f) miscellaneous. Within the larger divisions, there are three kinds of studies (a) those reporting the construction and validation of new instruments, (b) those appraising specific tests already available, and (c) those dealing with various questions concerning technics of testing.

Recent summaries and bibliographies—In the REVIEW OF EDUCATIONAL RESEARCH for June 1938, Watson (144) presented a three-year summary and bibliography of personality and character measurement including references to more than three hundred investigations. Nelson (88) reviewed the literature on attitude measurement and gave a bibliography of 183 titles. On the basis of an analysis of papers read at the 1938 convention of the American Psychological Association, Stagner (125) indicated trends in research upon character and personality. More recently, Bernreuter (8) presented an overview of the nature and uses of personality tests. Traxler (136) described and evaluated the personality measures judged to be most common and most useful. The construction and use of some instruments was described by Koos (69). Bibliographies of personality tests are included in the general test bibliographies referred to in the first section of Chapter I.

Personality Inventories

New and Revised Tests Yielding Several Scores

Link (78) published the 1938 revision of his PQ, or Personality Quotient Test. It is similar to the 1936 form, in that it yields an over-all score for personality and separate scores for social initiative, self-determination, economic self-determination, and adjustment to the opposite sex. It also gives a PQ, or personality quotient. Odd-even reliabilities (1936 edition) corrected by the Spearman-Brown formula are from .73 to .88.

¹ Bibliography for this chapter begins on page 73.

Cowan (21) made the second revision of his Adolescent Personality Schedule available and standardized it on about twelve hundred children, twelve to eighteen years of age. It is designed to measure maladjustment in nine fields. Bell (6) published the adult form of his Adjustment Inventory. It gives scores for home adjustment, health adjustment, social adjustment, emotional adjustment, and occupational adjustment. The odd-even coefficients of reliability predicted with the Spearman-Brown formula range from .81 to .94.

Thorpe, Clarke, and Tiegs (134) published the California Test of Personality, which is planned to measure personal adjustment and social adjustment of pupils in Grades IV-IX. There are several subtests within each main part. The results may be graphed in the form of a profile. The split-half reliability stepped up by the Spearman-Brown formula is .93 for the whole scale. Pintner and others (98) also prepared a personality inventory for Grades IV-IX. The average retest reliability for four administrations of the test to one hundred pupils in Grade V is given as follows: ascendance-submission .71, introversion-extroversion .70, and emotionality .72. Pintner and Forlano (97) validated the test by the outstanding characteristics of the pupils as reported by their teachers and concluded that the technics afforded a rough measure of the validity of the test.

On the basis of factor analysis studies, Guilford (47) developed an inventory for five factors which he called S, social introversion; T, thinking introversion; D, depression; C, cycloid tendencies; and R, rathymia or happy-go-lucky disposition. Two sets of reliability correlations which had been corrected by the Spearman-Brown formula were relatively high. The lowest correlation coefficient was .84 and the highest was .94. Washburne (141) published his Social Adjustment Inventory for diagnosis in clinics and counseling in secondary schools and colleges. The scoring device divides the test into eight subtests. Retest reliability of the entire instrument after an interval of one semester was .92.

Personality Measurement of the Survey Type

Remmers, Whisler, and Duwald (101) described the construction of a personality test for the adolescent level. A test of child personality was prepared by Baxter (5) and standardized for Grades I-VIII. This is one of the very few personality tests that attempts to cover the entire range of grades in the elementary school. The split-half reliability predicted by the Spearman-Brown method was .92. A psychosomatic inventory divided into two parts according to physiological functions and psychological functions was described by McFarland and Seitz (81). Percentile norms for men and women are intended to differentiate normal from neurotic individuals. The reliability of the total score is reported as .87 in the manual of directions. On the basis of the qualities most frequently mentioned in the literature

as contributing to an individual's social proficiency, Jackson (64) devised and validated a test of social proficiency. The reliability coefficient stepped up by the Spearman-Brown formula was .86. The author stated that consideration for others seemed to be the foundation of social proficiency.

Mitrano (86) described the preliminary work that had been done in devising a schedule to measure emotional stability in children and reported a reliability coefficient of .77 based on eighty-two cases. To investigate the emotional difficulties of students, Manuel, Adams, and White (85) prepared a blank consisting of thirty questions printed on one side of an answer sheet designed for the International Scoring Machine. The blank may be used in schools as well as colleges. The Spearman-Brown split-half reliability is about .77. Emme and Henry (30) designed an inventory to measure the affection or dislike of students for their parents and gave information about its validation. A manual for Louttit and Carter's psychodiagnostic blank was prepared by Carter (15).

Studies of the Bernreuter Personality Inventory

The already extensive bibliography relating to the Bernreuter inventory has been augmented considerably. Jarvie and Johns (66) found that the Bernreuter inventory offered little aid to the study of personality problems in the Rochester Athenaeum and Mechanics Institute. Stogdill and Thomas (126) found the Bernreuter Personality Inventory "very helpful in discriminating between well-adjusted and maladjusted students" in connection with a Student Psychological Consultation Service. Hathaway (54) showed the value of the Bernreuter inventory in diagnosing the adjustment difficulties of individuals classified as "constitutional psychopathic inferiors." St Clair and Seegers (114) supplemented an earlier study of the Bernreuter scoring keys with a study of the validity of the Flanagan scoring keys. The data were obtained from 1,162 college students. The results showed considerable validity for the F-1 score as a measure of self-confidence. The authors indicated that the F-2 score was inconsistent as a measure of sociability and that the B-1, B-2, and B-4 scores provided a more refined analysis.

Nemzek (89) investigated the value of the B1-N, B2-S, and B4-D scales of the Bernreuter Personality Inventory for the prediction of academic success of secondary-school pupils as measured by teachers' marks. The scores on the scales were found to be of little value in predicting achievement in the various school subjects. In studies of the stability of scores of college students on the Bernreuter inventory, Farnsworth (32) and Kirkpatrick (68) reported retest correlations of scores obtained at intervals of a year or more. For an interval of one year, Farnsworth found r 's ranging from .70 to .77, for two years from .56 to .74, and for three years from .44 to .72. In Kirkpatrick's article, the correlations between scores at the beginning of the freshman year and the end of the sophomore year

averaged about .7. These correlations indicate that whatever is measured by the Bernreuter inventory is fairly stable, although not exceptionally so. Farnsworth and Ferguson (34) reported the scores on two administrations of the Bernreuter inventory to a college student who subsequently committed suicide.

Studies of the Humm-Wadsworth Temperament Scale

Rather detailed studies of the Humm-Wadsworth scale were reported by Kruger (71) and by Dysinger (28), and the conclusions of both studies were somewhat unfavorable to the scale. Kruger analyzed the intercorrelations between the components of the scale on the basis of the scores of 437 men who consulted the Adult Guidance Service in Los Angeles and concluded that the intercorrelations for the components of temperament, with the exception of normal, are not in accord with the theory that such identifiable syndromes exist. She recognized, however, that there were certain limitations in the composition of the group studied. Dysinger found that the data from 307 university students were different in several ways from those used in the original standardization of the scale. There seemed to be an undue concentration of scores at one extreme or the other in several of the components. However, the reliability of the scores was high and the low intercorrelations between the components indicated that the scale was actually probing various phases of personality.

Humm (59, 60) published replies to both articles. He criticized Kruger's analysis from the standpoint of sampling, criteria, and mathematical treatment. He pointed out that Dysinger had not taken into consideration all the statistical data that the authors had made available in the manual. He called attention to the recommendation that the scales be accepted or rejected on the basis of the proportion of *no*-responses. He also suggested that Dysinger's correlation fields might be curvilinear. With respect to the point concerning the influence of *no*-responses on the data, Humm, Storment, and Iorns (61) recently published regression equations for combinations of scores which were intended to counteract the tendency of the component to vary unduly with a high proportion of *no*-responses. Hemm-sath (55) described the use of the Humm-Wadsworth temperament scale in connection with the employees of a bank and presented and discussed six illustrative profiles.

Studies of Other Personality Inventories

Thomson (130) summarized and interpreted the scores of 259 high-school pupils at Mooseheart, Illinois, on the PQ, or Personality Quotient Test. Among the results, it was reported that pupils with high PQ's have a slight advantage in academic competition and that there was no statistical evidence for the assumption that low PQ's are associated with problem behavior. Roslow (108) outlined a plan used in establishing the validity

of the PQ test by means of tests administered in fifty high schools and colleges throughout the United States. A criterion of personality involving leadership and social cooperation was employed. Pedersen (94) investigated the validity of the Bell Adjustment Inventory on the basis of scores and ratings of 380 freshman women at the University of Rochester. Evidence of validity was found for the home adjustment, health adjustment, and social adjustment scales, but there seemed to be no difference between the emotional scores of those rated maladjusted emotionally and the other students.

Harriman (50) reported a study of the predictive value of the Woodworth-House Mental Hygiene Inventory on the basis of an analysis of the records of forty-seven college students whose test blanks indicated a large number of problems. The practical advantages of the inventory were questioned because of the fact that the scores were predictive of subsequent maladjustment in not more than 30 percent of the cases. Wolf (153) compared the scores made on the Woodworth-Cady Personal Data Sheet and on Baker's Telling What I Do Test by two groups of girls that were almost equal in intelligence but that differed greatly in academic achievement. The Woodworth-Cady questionnaire made statistically significant differentiation between the success and failure groups. In the case of the Telling What I Do Test, there was a strong probability of a true difference. Two articles on revisions of the A-S Reaction Study were published. Ruggles and Allport (109) reported a revision of the form for women and gave new data about the reliability, validity, and uses of the scale. The reliability through the application of the Spearman-Brown formula was found to be .90. Schultz and Roslow (116) described a restandardization of the business revision of the A-S Reaction Study. The authors pointed out that the previous use of the business revision had been limited because the scores were spread over a large range and tended to be distributed rectangularly. The restandardization yielded a distribution of scores that seemed to approximate the normal curve.

Several persons have recently reported studies in which two or more personality inventories were administered in such a way as to make possible certain comparisons between them. Wasson (142) gave the Allport A-S Reaction Study, the Willoughby Emotional Maturity Scale, the Humm-Wadsworth Temperament Scale, and a Case-Study Questionnaire to ninety-three men students in a university and studied the interrelationships of the scores on the different scales. Farnsworth (33) administered the Willoughby Emotional Maturity Scale, the McNemar-Landis modification of this test, the Pressey Interest-Attitude Test, and the Landis Questionnaire to groups of college sophomores and correlated the results. None of the intercorrelations were significant except a correlation coefficient of .46 between the original and the modified Willoughby scale. It appeared that the tests were not measuring the same variable. J. Greene and Staton (45) administered the Willoughby scale together with the Bernreuter

inventory, the Bell inventory, three tests for teaching aptitude, and four supplementary measures including grades, intelligence-test scores, the Wrenn Study-Habits Inventory, and Sims' Socio-Economic Status to one hundred students in the College of Education at the University of Georgia. It was found that only nine of thirty-six correlations between teaching-aptitude measures and measures of emotionality and adjustment were statistically reliable.

Peters (95) studied the extent to which scores based on the Bernreuter, the Bell, and the Link personality inventories agreed with the behavior of university freshmen as observed by others. "High" and "low" classes were determined for each of nine traits and one over-all trait, and a new technic for computing biserial r 's from widespread classes was used. The validity correlations ranged from $-.07$ to $+.50$ and averaged about $.26$. Harris and Dabelstein (51) studied the Maller Case Inventory and the Boynton B.P.C. Personality Inventory on the basis of the scores of 421 pupils in Grades V to IX, inclusive. A factor analysis by the Thurstone method indicated that three general factors, or possibly four, would account for the relationships among the subtests of the Maller inventory, the keys of the Boynton inventory, and mental age and chronological age.

Simplified Scoring of Personality Tests

Certain personality inventories are scored with several different scales in which differential weights are applied to the various test items. Since this is often a time-consuming and laborious procedure, attempts to simplify the scoring are naturally made from time to time. For instance, Bennett (7) reduced the weights of the items in the two Flanagan scales of the Bernreuter inventory to zero, one, and two instead of the regular range from minus seven to plus seven, and rescored 115 inventories with the simplified scales. The scoring with the simplified scales correlated with the original scoring to the extent of $.97$ for the FI-C scale and $.98$ for the F2-S scale. New regression equations for determining the Bernreuter scores were also prepared and the results studied. A short scoring method was worked out for the Link PQ test by Gibbons (43) but this was accomplished by mechanical procedures rather than by making a fundamental change in the original scoring method. A procedure was set up for using special scoring strips and two Veeder counters in such a way that the scoring time for the PQ test was reduced from twenty to eight minutes.

Validity of Self-Estimates of Personality

Since most personality inventories call for self-estimates on a series of items, the question of the correctness with which individuals ordinarily make judgments concerning their own personality characteristics is an important question. Tryon (137) reported on the basis of a verbal portrait-

matching test that there was a tendency for students to look more favorably upon their own personality qualities than their peers did, but that this tendency varied widely among the traits. Crook (23) reported a similar conclusion as a result of administering the Willoughby Personality Schedule to two sections of a class in elementary educational psychology and then asking the students whether they felt that the changes in their personality had been in a favorable direction. It was felt that the data indicated that most people are overly optimistic in estimating the trend of their personality development. On the other hand, Robertson and Stromberg (104), using the Royer Personality Inventory, found that college junior and senior women did not rate themselves significantly higher on the average than they were rated by friends.

Spencer (122) administered a personality questionnaire to high-school juniors and seniors using care to preserve the anonymity of the responses. After the questionnaire was completed, the pupils were asked to indicate whether or not they would have answered all questions truthfully and willingly if they had been required to sign their names. Only 43 percent of the total population answered affirmatively. The author concluded that if the pupils had been required to sign the questionnaire, the purpose of the instrument would have been invalidated. Lentz (76) studied the effect of acquiescence, or the tendency to agree rather than disagree to propositions in general, on personality measurement and concluded that acquiescence may be a very distorting factor. It was indicated that no solution has been found to this problem except the employment of the double-presentation method, which is cumbersome for general use.

Stability of Scores on Personality Inventories

Pintner and Forlano (96) administered the Aspects of Personality Inventory to fifth-grade pupils four times at intervals of two weeks. Inter-correlations between the scores on the separate trials varied from .61 to .83. Robertson and Stromberg (105) gave the Royer Personality Inventory to forty-six college women in September 1935 and again in January 1938. The mean score changed in the direction of the more dominant, extroverted, non-neurotic person. Hertzman and Gould (57) studied the functional significance of changed responses in a psycho-neurotic inventory. They used forty-two items selected from the original Woodworth personal data sheet and administered them twice to 147 women students with an interval of four weeks between administrations. The responses were changed most frequently to items in which the word "often" was used.

Introversion-Extroversion

The term "introversion-extroversion" is one of the most common concepts in personality measurement and yet it is one concerning which there is not by any means entire agreement. Abernethy (1) administered an in-

ventory consisting of forty-four questions selected from tests of introversion-extroversion to 289 college students and 124 adults and attempted to determine whether there really exists a marked negative correlation between "liking thought" and "liking people." The correlations obtained were very low. The author concluded that the data did not substantiate the popular assumption that interest in people is incompatible with interest in thought, planning, and detailed observation. Collier and Emch (18) asked psychologists to classify items from seven representative tests of introversion-extroversion according to the degree of introversion or extroversion each item seemed to express. There was considerable variation of opinion as to whether the items described introversion or extroversion. Three tests consisting of introversion-extroversion items were administered to students and critical ratios were determined for the different items and compared with the ratings of the judges. The agreement was not close.

Factor Analysis in the Study of Personality

Reference has already been made to certain recent studies of personality tests in which factor-analysis technics were employed. Several other studies of this kind may be cited. In an attempt to bring out more clearly the primary traits or dimensions of rathymia and of thinking introversion-extroversion, Guilford and Guilford (48) administered a set of eighty-nine personality questionnaire items to one thousand students and analyzed the intercorrelations between thirty of them by Thurstone's method. Nine primary factors were found, six of which were identified as: D, depression; R, rathymia; S, shyness or seclusiveness, T, habitual thinking of a meditative sort, Lt, liking for thinking of the problem-solving kind, and A, alertness. Guilford and Guilford (49) analyzed twenty-four items designed to bring out differences in hyperactivity. The analysis indicated that there were probably four dimensions of hyperactivity-hypoactivity. Two of them were identified as N, nervousness or jumpiness, and GD, general drive, while the other two could not be identified.

Brogden (14) attempted to determine what character traits were involved in the scores of one hundred sixth-grade boys on a group of forty tests purporting to measure various aspects of character, intelligence, and personality. Eight factors seemed to be involved, among which were the following five character factors: a persistence factor, a factor that seemed to be related to the *w* factor of the Spearman school, a self-control factor, an honesty factor, and an "acceptance of the moral code" factor. Reyburn and Taylor (102) selected nineteen of the traits used by Webb in his character analysis for further factorial analysis by Thurstone's method. Four personality qualities were isolated: a factor similar to Cattell's surgery-desurgence, a factor resembling perseverance, a factor which the authors called charity in the sense that the term is used in the Epistle to the Corinthians, and a factor called social sensitiveness. McNamara

and Darley (82) reported a factor analysis of test-retest performance of university students on the Minnesota Scale for Survey of Opinions, the Bell Adjustment Inventory, and the Minnesota Inventories of Social Attitudes. Adjustment to authority, socialized interests, and economic conservatism were among the factors isolated.

Gannon (40) sought to determine the dominant groups of personality traits among college men. The data were factored by the Spearman and Thurstone technics and yielded five groups of traits. Three of these belong to the introverted category and two to the extroverted category. In view of the popular tendency to regard extroversion as desirable and introversion as undesirable, it is interesting to note that while the first extroverted group implied adequate adjustment, the other extroverted group represented a maladjusted trend generally characterized by troublesomeness.

Analysis of Items

Rundquist (110) concluded that the negative or "unacceptable" type of item is more valid than the positive or "acceptable" type. Layman (75) made a critical analysis of 782 test items taken from sixteen personality tests. The results suggested that "very few personality test items are such that they will present an adequately discriminative picture of an individual's behavior tendencies or personality 'traits'" (75:104). The most reliable items were of three types: (a) those which might be suggestive of abnormal tendency, (b) those which do not permit a variety of interpretations, and (c) those referring to behavior which does not change within short periods of time.

Experiments with Unusual Approaches

Trawick (135) set up and applied a procedure for selecting trait-consistent individuals. He reported that trait-consistent personalities tend to possess insight and to be self-confident, objectively modest, and goal seekers. McQuitty (83) used responses of college students and psychotic patients to certain questions in the Bernreuter Personality Inventory and the Strong Vocational Interest Blank in the development of indexes of concomitance of egocentrics—that is, relationship between self-concepts and objective concepts. He found well-interrelated egocentrics in the students and uninterrelated egocentrics in the psychotics. Zubin (157) stressed the need for the *integral* method to supplement the prevalent *differential* method of personality study and presented a technic for dividing a group into subgroups of like-minded or like-structured individuals with reference to a given social criterion. In a study of the "fulcra of conflict," Spencer (123) presented what is apparently a new approach to personality measurement. He indicated that personality conflict is a degree of discrepancy or incongruity between one's self-report of his own characteristics and behaviors and his comparable report on certain

ideals and behavior of others. The "fulcra of conflict" used in this study are the subject's ideals about behavior, his father's ideals, his mother's ideals, his father's behavior, his mother's behavior, and the behavior of his closest associates.

Interest Inventories

Several interest inventories have been published or described in the literature since January 1938. One of the most interesting of these is the *Preference Record* prepared by Kuder (72, 73). Information about this new blank was given in Chapter IV. Three interest-values inventories that to some extent reflect the influence of Spranger's Types of Men and Allport and Vernon's Study of Values test were reported by Maller and Glaser (84), by Wickert (148), and by Van Dusen, Wimberly, and Mosier (140). The inventory by Maller and Glaser is designed to measure four major types of interests or basic values: theoretic, esthetic, social, and economic. Test-retest reliabilities after a ten-day interval are given as .91 for theoretic, .93 for esthetic, .92 for social, and .87 for economic. These are high for test-retest reliability coefficients. Wickert's test was planned to measure nine general desires or goal-values. The author reported that the reliabilities of the goal-values categories were too low for purposes of individual prediction but were high enough for the study of group relationships. The inventory by Van Dusen, Wimberly, and Mosier was based on Lurie's factor analysis of Spranger's Value Types. It consisted of a series of five scales designed to measure economic, theoretical, religious, social, and esthetic attitudes. The reliability of the economic scale was given as .71. The reliabilities of the other scales ranged from .80 to .88.

One of the objectives of the thirty schools participating in the Eight-Year Study of the Progressive Education Association is the development of interests. Various devices for measuring interests have been constructed in connection with that study. For instance, Sheviakov and Friedberg (120) reported the preparation of three interest inventories. One deals with the study of the different school subjects and the other two relate to extracurriculum activities and out-of-school situations. The interpretation of the interest inventories and procedures used in validating them are dealt with. The widespread interest in vocational guidance has led to the preparation of various vocational interest inventories during the last decade. The Strong blanks for men and for women are undoubtedly the best known of all these inventories. Strong (127) recently revised his interest blank for men, prepared a number of new scales, and simplified the scoring by reducing the range of weights assigned to the individual items.

Evaluation of Interest Measures

Skodak and Crissey (121) presented an analysis of the scores made by 297 high-school senior girls on the Strong blank for women, the results

of which raised a question concerning whether the blank was sufficiently discriminative to be of value in vocational guidance. Seder (117) obtained the scores of women physicians and life insurance saleswomen on the Strong blanks for men and for women in connection with the occupations for which both blanks could be scored. The data indicated that both blanks were quite reliable. The results of factor analysis showed that the keys with the same names for the two blanks had similar factor loadings, except the lawyer's keys. The analysis indicated that the interests of men and women engaged in the same occupation tend to be similar and suggested that separate occupational scales for the two sexes were not needed. Williamson (150) studied the validity of the Young-Estabrooks studiousness scale on the Strong blank for the prediction of the marks of university freshmen. The correlation of .20 indicated negligible validity for this purpose. Kopas (70), using twenty-four of the occupations in the Strong blank, set up a simplified scoring procedure which requires a half hour or less rather than the several hours which are needed if a blank is scored by hand according to the standard procedure. The scores obtained in this way correlated from .49 to .71 with the standard scores for the different occupations. Although these correlations seem rather low, it was reported that the area of highest interest was the same in 82 percent of the cases.

Darley (24) investigated the relationships of the results of the Strong interest blank to attitude and adjustment as measured by the Minnesota Scale for the Survey of Opinions, the Bell Adjustment Inventory, and the Minnesota Inventories of Social Attitudes. The data showed that the "attitude and adjustment tests not only derive meaning from their relations to the vocational interest test, but also add meaning to it by complementing its definitions of occupational interest types." Sarbin and Berdie (115) studied the relationships between the interests measured by the Strong blank and the values measured by the Allport-Vernon scale. It was found that some occupational groups showing measured interest patterns were characterized by certain profiles on the Allport-Vernon scale. Groups may be differentiated in this way, although individual application of the results would not be advisable. The constancy of the scores of college students on the Allport-Vernon test was investigated by Whitely (146). The mean scores agreed closely from one year to the next. The coefficients of correlation ranged from .38 to .78. With the exception of the results for the religious scale, the mean scores were in close agreement with the norms. Thorndike (131) criticized the Pressey Interest-Attitude Test from the standpoint of proportion of immature to mature items and presented data to show that a person may obtain a low maturity score merely because he checks all items very extensively. In a reply to Thorndike's article, Pressey (99) pointed out that the test differentiates according to age and correlates with other measures of emotional maturity.

Technics of Measuring Interests

E. Greene and Dahlem (44) reported a study of grouping the items of a vocational interest schedule into occupational divisions instead of arranging them alphabetically as is more common. The grouping of 181 vocational preference items under eleven headings brought about improved reliability (.89 as compared with .76), but caused no significant changes in distributions of ratings, and gave evidence of only slight halo effect. Rock and Wesman (106) investigated the relative efficiency of twenty different methods of weighting responses in the scoring keys for an interest test. They found that "reduced" and "unit" methods were considerably less efficient in separating groups than methods in which larger and more variable scoring weights were used.

Flanagan (39) described a novel approach to the measurement of interests based on the Cooperative Contemporary Affairs Test which measures the extent to which information concerning events in the preceding year has been acquired and retained. The profiles of relative scores were presented as measures of functioning interests. The validity of the measures was studied by comparing the results of the test with other data. This method is free from personal bias and wishful thinking

Attitudes and Opinions

New Tests of Social Attitudes

Hunter (62) prepared a test of social attitudes containing ninety-four statements divided into the following categories: Negro, war, economics and labor, social life and convention, government, religion, and miscellaneous. The manual of directions gives the reliability of the whole test as .87 when predicted from the correlation of odd and even scores. The test may be used with college students and adults. Wrightstone (154) published a Scale of Civic Beliefs which is designed to measure racial attitudes, international attitudes, national political attitudes, and attitudes toward national achievements and ideals. The test is for use in Grades IX to XII inclusive. The reliability, based on the correlation of Form A with Form B for 252 pupils in Grades X to XII inclusive, is .897. A test of opinions and beliefs concerning certain social issues, known as A Survey of Opinion, was issued by the Committee on Evaluation Materials of the Institute for Propaganda Analysis (63). It is intended for experimental use in high schools, colleges, and adult discussion groups. There are two forms, each consisting of twenty-five questions so arranged that the statements in Form 2 are the paired opposites of those in Form 1. The test-retest reliability of the total test is reported as .90 in the manual of directions.

Gristle (46) described the construction of a scale for measuring attitude toward militarism-pacifism. Allport (2) outlined the construction and

use of a telic scale for measuring war-producing behaviors, which included five types of international crises employed as hypothetical situations Hartmann (53) assembled 106 statements on controversial issues to form a measure of liberalism or conservatism and validated the items, using the method recommended by Kelley Pace (91) pointed out the limitations in the customary use of opinions as indicators of attitudes and attempted to set up a different indicator based on what an individual says he would do in a variety of situations rather than what he says he believes Data were presented to show that the test was sufficiently reliable and valid for ordinary classroom use. In a later study, Pace (92) reported a study of the relationships between a Situations-Response Survey and a Survey of Opinions designed to measure fundamentally the same liberal-conservative attitudes. The correlation between the two tests was .894. The results of the study indicated that the situations-response survey was a somewhat more discriminative instrument than the opinion scale.

Ferguson (37) reported a study leading to the isolation of two primary or independent social attitudes which may be described by or predicted from scales for the measurement of attitudes toward (a) war, capital punishment, and the treatment of criminals, and (b) reality of God, evolution, and birth control. The study was based on the administration of certain Thurstone attitude scales to 185 Stanford University students. In a later article, Ferguson (36) presented the development of scales for the measurement of the two primary social attitudes, which he called "Religionism" and "Humanitarianism" The reliabilities of these two scales were reported as .82 and .88 respectively. Geiger, Remmers, and Greenly (41) set up a scale for measuring apprentices' attitudes toward their training in such a way that six "intra" attitude scales were included in the generalized attitude scale. Hinckley and Hinckley (58), using a scaling technic similar to that of Thurstone, constructed scales to measure the following attitudes: (a) attitude toward the work relief program as a solution to the financial depression, (b) attitude toward personal responsibility in earning a living, and (c) attitude toward receiving relief.

New Tests of School Attitudes

Tschechtelin and others (138) developed general survey and diagnostic attitude scales to measure pupils' attitudes toward teachers This type of scale was used with 1,357 children in Grades IV to VIII The correlation between Form A and Form B was .79 A questionnaire somewhat similar in purpose was prepared by Tenenbaum (129) This test was planned to measure the attitudes of children toward teachers and classmates Spearman-Brown reliability coefficients of .853 and .907 were reported. Eells (29) constructed a scale for the evaluation of pupils' attitudes toward various aspects of secondary schools Bolton (10), using the Thurstone-Chave method of equal-appearing intervals, developed two comparable

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scales for the measurement of attitudes toward mathematics. One scale was prepared recently for measuring teachers' attitudes toward problem situations at the high-school level. The study was reported by Anderson (3) as one of a series of investigations at the University of Illinois. The scale was based on a list of technics which teachers reported they had used in dealing with different school problems.

Technics of Measuring Attitudes and Opinions

Ferguson (38) listed seven requirements of an adequate attitude scale and concluded that the method of equal appearing intervals satisfies a larger number of these requirements than any other method. Whisler (145) discussed the reliability of attitude scales as related to scoring method and pointed out that there is a positive relationship between the number of items in an attitude scale which are accepted and the reliability of the scale. Lorge (80) published two articles on the reliability and consistency of responses to fifteen of the Thurstone attitude scales. He found that rejected items (those not accepted by the person taking the test) should not be given as much weight as those accepted, and that the responses of individuals aged forty or over were more reliable and more consistent throughout the fifteen attitude scales than were responses of persons aged twenty to twenty-five. Should statements be arranged in random order or order of descending scale values? Dunlap and Kröll (26) found that the means, dispersions, and reliabilities of the scales were not affected by the arrangement of the items. This finding led to the conclusion that the arrangement of the statements in descending order is preferable because of the greater ease of scoring. An additional finding was that if the subject was instructed merely to mark the three statements with which he was most in agreement, the scoring time was reduced without sacrifice in reliability.

Stagner (124) studied the cross-out technic as a method in public opinion analysis and found that it had validity for groups of stated political preference and showed considerable consistency. Fauquier (35) experimented with the measurement of attitudes of delinquent and normal boys by having each subject write his first four associations to each of the words hate, fear, love, and desire. Certain qualitative differences in the attitudes of the groups were discovered through an analysis of the associations. Ojemann (90) pointed out deficiencies in scales prepared by the Thurstone procedure and described a revised method of scale construction which attempted to obtain a deeper sampling of integrated performances. Tuttle (139) also criticized the Thurstone technic but offered no other technic as a substitute.

A question in all attitude measurement is whether there are general attitudes or whether attitudes are specific to a given object or situation. Lentz (77) investigated generality versus specificity of conservatism with

an instrument including 190 items sampling conservatism in six fields: education, religion, government, sex, nonsocial, and general. The median of fifteen intercorrelations was .73. It was felt that this degree of correlation supports the concept of general conservatism. Wickert (147) carried on a rather extensive study of interrelationships of general and specific preferences, and concluded that "the concept of general attitudes may usefully be employed in psychology along with that of specific attitudes."

Persistence Tests and Other Measures

The measurement of persistence has long been one of the most interesting and at the same time baffling phases of personality testing. It is recognized that many instances of disparity between ability and achievement are explained by variation in a complex of personality factors covered by the term persistence. Ryans published four recent articles on the subject. In the first of these (111.333-53) he subjected the results of nineteen tests and ratings of college sophomores to a multiple-factor analysis by the Thurstone method and isolated a general persistence factor and an intelligence factor. In a second article, Ryans (111.355-71) described the preparation of a group persistence test having a reliability of .82, the components of the test being study time, extended arm endurance, and a form of persistence schedule. In a subsequent article (113), he reported uniformly low correlations between persistence scores and scores on the Bernreuter Personality Inventory. In a historical review of the measurement of persistence, Ryans (112) stated that "the extent to which an individual will endure fatigue, discomfort, or pain, the amount of time he will spend studying, and the amount of time he will spend working at specific tasks seem to be indicative of degree of persistence" (112.736). He pointed out that the existence of a general trait of persistence which permeates all behavior of the organism has not been established. Thornton (132), and Thornton and Guilford (133), reported a factor analysis of twenty-two tests purporting to measure persistence. The analysis did not reveal any factor universally present but showed the presence of five common factors, described as (a) an ability or willingness to withstand discomfort in order to achieve a goal, (b) a factor of keeping on at a task (plodding), (c) physical strength, (d) mental fluency, and (e) feeling of adequacy.

Construction of New Rating Scales

Kelly (67) described a 36-trait personality rating scale of the graphic type, each question of which was rated on a 25-division scale. The reliability coefficients for the different scales ranged from .31 to .86. Norms based on the rating of 299 men and 299 women were set up for the scale and the usefulness of the scale in counseling was indicated. Pechstein and

Munn (93) designed a long and a short form of a rating scale of social maturity for use in the primary grades, a level at which good instruments for the evaluation of behavior are much needed. Fourteen patterns of social maturity were represented in the long form. Reliability coefficients were reported as .83 for Grade I and .98 for Grade III. Wolf (152) constructed a self-scoring form of the Vineland adjustment score card and compared results of using it with data obtained on the standard form filled out by the teacher. The self-scoring form differentiated somewhat more reliably between a group of high-achievement girls and a group of low-achievement girls than the form on which teachers did the rating.

Evjen (31) devised a behavior frequency scale applicable to school situations. Thirty-three items are included in the rating, which is based on the frequency of observations of the type of activity listed. Cowell (21) described the development of a form for use in rating behavior trends of high-school pupils on the basis of statements that presented opposites of each behavior trend. Anderson (4) described technics for recording dominative and integrative contacts of teachers with kindergarten children. An observation blank was prepared and employed in observation of three different kindergarten groups. Exceptionally high reliability coefficients (.95 to .97) were obtained between seventy-three pairs of consecutive and simultaneous records of five minutes each made by two observers. Dominative contacts exceeded integrative contacts for all teachers. A behavior rating scale for young chimpanzees was made by Crawford (22) consisting of twenty-two items whose average reliability, following the application of the Spearman-Brown formula, was .86.

Aspects of Rating Scale Technics

Certain studies, a number of years ago, led to the conclusion that the optimal number of divisions in a rating scale was seven. Champney and Marshall (16, 17) obtained ratings on about thirty characteristics of parental behavior by means of a graphic rating scale divided into various numbers of units from three to ninety. It was found that the reliability of the ratings increased markedly with increase in number of units up to about twelve and that there was a less noticeable increase in reliability up to about thirty intervals, beyond which there was a small decrease. Wilke (149) studied the question of whether ratings for a group of persons, based on a seven-step scale, can be adequately summarized. He obtained a coefficient of contingency of .87 between the summaries of two independent readers. Lombardi (79) devised a rating method which is unique, in that it involves not comparison of individuals but comparisons of traits within an individual. Any trait among the fifty on the scale can be selected as the calibrator and the other forty-nine traits judged as more or less conspicuous than this one. The reliability of the scale was reported

as .82. The technic suggests interesting possibilities for investigating the organization of personality.

Other Measures and Procedures

Swineford (128) advanced a technic for the measurement of a personality trait which is not dependent upon questionnaires, self-inventories, or ratings. In an objective subject-matter test, each individual was permitted to determine for each item the number of points to be received for a correct answer (not more than four), with the understanding that if the answer was incorrect, twice the number of points selected for credit would be deducted. This procedure was used as a test of tendency to gamble. It was found that the gambling score was quite reliable and was independent of achievement on the same test. In a study of the measurement of social status, Zeleny (155) defined social status as the degree of acceptance of a person by his associates and developed mathematical formulas for a social-status ratio and a social-status score. The social-status score was later criticized by Dubin and Winch and defended by Zeleny (156). Rinsland (103) described an objective test for measuring teachers' knowledge of the conduct and personality of children from six to eight years of age.

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CHAPTER VI

Projective Methods in the Study of Personality¹

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SINCE PROJECTIVE TECHNIQUES have not previously been systematically reviewed in this magazine the present summary will not confine itself to the usual three-year period. Strang (72) dealt with a number of the technics in connection with mental hygiene, in the preceding issue. A number of general reviews have been published elsewhere. Horowitz and Murpny (33) referred to the growing tendency to supplement paper and pencil technics with the use of a variety of materials and methods to reveal conscious and unconscious motivation, attitudes, and needs. The authors discussed variations in materials used, from unstructured or inchoate material like clay, sand, water, through semi-structured inkblots, to the unequivocal forms of the family dolls or conventional toys. There is a parallel gradation in freedom or precision of method. They considered the possibilities of picture tests calling for interpretation, choice, or evaluation which can be used as a mirror for the child's conception of himself and his social attitudes.

Frank (24) examined the dynamics of personality and the possibility of measuring it as a process. While standardized tests tell how nearly the individual approximates to a norm, projective technics should reveal the private world of meanings and feelings since they require the subject to organize the field, to interpret the material, and to react affectively to it. Frank classified responses into (a) *constitutive*: when the subject imposes a structure upon a plastic, unstructured substance such as clay, or upon partially structured fields like the Rorschach inkblots; (b) *interpretive*: when the subject tells what the stimulus situation, a picture, for example, means to him; (c) *cathartic*: when the subject discharges feeling upon the situation, as in play; (d) *constructive*: when the subject builds with given materials, like blocks, and in construction reveals some of his own organizing conceptions. Frank gave examples of projective methods, mentioning Stern's cloud pictures, Rorschach inkblots, play, finger painting, expressive movements, drama, puppet shows, music, and the Thematic Apperception Test, showing how the subject projects the dynamics of his personality and so reveals "what he cannot or will not say."

Updegraff (76) reviewed projective technics in the study of preschool children and showed how they elicit the expression of the child's fundamental attitudes. Liss (45) referred to the work of Freud (25) and Klein (37) and pointed out that the purpose of the technics is to secure positive transference and to evoke material which will be used in the way in which the psychoanalyst uses dream material. The extensive exploratory work

¹ Bibliography for this chapter begins on page 90

of Murray and his collaborators (56) shows a wide variety of projective technics in operation. Fifty men of college age were studied for a two and a half year period by twenty-eight trained investigators. Some of the procedures used were conference, autobiography, drama, construction, Rorschach, and Thematic Apperception. The writers offer a theory of personality and a functional survey of projective technics.

Drawing

Recent writers in this field refer to, and in some cases review, the accumulation of psychological literature on the significance of drawing ability as an indication of intelligence, of developmental stages, and as the basis for comparative studies. But there is also in process a progressively richer psychiatric literature which is concerned with drawing as expressive movement, as an easy channel for the flow of the inner dynamics of personality, and as a therapeutic agent. Appel (3) used the drawings of children as aids to personality studies. He asked the children to draw their homes, the persons who lived there, their friends, three wishes, and so forth. He found this informative with regard to the child's social setting and a helpful approach to the inner unofficially expressed lives of the children. Appel used the drawings primarily as a starting point for conversation and did not seem to be concerned with drawing as a function significant in itself or with the latent content as distinct from the manifest content. Griffiths (26), in her study of the phantasy life of fifty children from five to five and a half years of age, acknowledged drawing as a process of self-revelation and as a therapeutic technic. Despert (18) in her work with children at the Psychiatric Institute, New York, was convinced of the diagnostic and therapeutic value of drawing. She also pointed out the value of the motor activity *per se* and said that, contrary to the usual belief that this method is best with inhibited children, she found it worked best with restless children, especially those in whom unconscious fears were underlying apparent aggressiveness and overactivity. This study is one of the most helpful in providing insight on the interpretation of children's drawings as revealing deeper motivation.

Liss (44) analyzed the psychodynamisms at work in the drawing process, noting the function of aggression and anxiety. The diagnostic criteria are size, form, color, and symbols, analysis of which gives, for example, a picture of inner attitudes, ego evaluation, and attitude to space. Buhler (11) studied the performance in the Ball and Field Test of 165 children, varying in intelligence and in adjustment. She found that unsuccessful solutions—confused and involved—were given by 78 percent neurotic, 20 percent low intelligence, and 2 percent normal. She concluded that this test is symptomatic and diagnostic of emotional problems in children. Abel (1) set up an experimental situation to study the value of the drawing of free designs, with limiting conditions, as a personality index. The

task was to draw a free design with nineteen straight lines and six curved lines, within a 4 by 6 inch rectangle. The results were that the schizophrenics showed meticulous adherence to instructions, the normal white and Indian groups showed an absence of originality and creativeness, and the Balinese had difficulty in organizing the material.

McIntosh (48) reported on the use of children's drawings as a means of psychoanalysis. Six children, three boys and three girls, from six to thirteen years old, IQ's 68-126, all maladjusted, were analyzed chiefly through their drawings, their related associations, and the interpretation of the drawings and the associations. Drawing was felt to be a useful technic especially for those in later childhood and for those too old for the regular play technics. Spoerl (71), by sorting and matching technics, tried to establish the relationship between pictures and personality in a group of retarded children. He had drawings from eleven children, from seven to nine years old, and 164 judges. The first task was to put together pictures believed to be done by the same child. The second task was to identify the drawings with a personality description. Both the sorting and the matching tasks showed that in about 36 percent of the cases this was done correctly. The conclusions were (a) the drawings of a single child are highly consistent and easily identified, (b) personality can be judged from drawings. Reitman (63) used twelve line drawings showing facial expressions indicative of different emotions, shown to the patient who had to reproduce them. In the reproductions, patients depicted their own emotional states. Fleming (22) reported on the use of finger painting which had previously been developed by Shaw (67) and Shaw and Lyle (68), and which may be considered as midway between a play and an art technic.

Play

Walder's article (79) is a useful orienting introduction to play as a projective technic. He summarized theories of play found in academic psychology and proposed an explanation of the psychoanalytic theory of play. Academic psychology has sought to explain typical and traditional play in terms of atavism, mimicry, excess energy, preparation for the future, and in terms of functional pleasure. Psychoanalytic psychology is not able to supply a unitary explanation by which all play can be interpreted. It is a unique phenomenon which may have a number of determinants and various meanings. The psychoanalyst is primarily concerned with the person who plays and what it means to him. He may see in his play the drive for mastery, wish fulfillment, the attempt to assimilate by repetition overpowering experiences, transformations from an enforced passive role to a self-assumed active role, a leave of absence from reality and from the superego, and the weaving of phantasies about real objects. Despert (18) gave a survey of literature on play and a

classification of technics. Suitable playroom equipment was described and play as a means of affective abreaction and of getting information. The June 1938 issue of *Understanding the Child* dealt with the child at play. Half the articles were concerned with the developmental and pedagogic implications of play activity and half with play as a diagnostic and therapeutic technic. Weiss-Frankl (80) showed how play is the equivalent of interview analysis in the adult. Simpson (69) reported several cases and indicated that the first play interview frequently reveals the child's focal problem. Rank (62) quoted Freud's observations of the play of an eighteen-month-old boy who dramatized in his play the going away and coming back of the mother. To the analyst, play is an important medium of expression—the language of the child—and not necessarily therapeutic in itself.

Lowenfeld (46, 47) regarded play as the expression of the impulses and ideas which have been repressed from consciousness owing to their incompatibility with other parts of the psyche. This "primary system" cannot be represented in words but can in play. The "secondary system" which increases in volume as the primary system decreases is cognition. If a child fails to express the material of his primary system so as to make contact with it, there is a tendency for ideas of the primary system to dominate him and so adaptation to life is unsatisfactory and neuroses may result. Lowenfeld believed that play can relieve many slight neuroses. Despert (18) found that latent aggressive trends could be aroused by the repeated use of a sharp instrument. Early forgotten memories of a hostile nature were reactivated, and phantasies of aggression were brought to consciousness. Through free association the child was helped to gain insight into his deeper motivation. Conn (13) believed that play is the key to the locked door of what the child feels and needs. He used toys as a device for the child to express his feelings. He did not attempt to interpret to the child. Through a third-person-conversation centered on the dolls, the child gave what is virtually a biography. The child's feelings became desensitized by his being able to talk about them.

Solomon (70) illustrated the use of active play, based on the work of Conn (13, 14, 15), and claimed that it was a short, effective method. The therapist was active, asking direct questions and offering ideas; the series of dolls and toys were operated in an assiduous fashion; the play situation was created for the child. The child revealed directly how he was functioning in his social environment and his feelings about the people there. There was little need for the interpretation of symbols as there was in the case of plastic materials, since the child expressed life reactions without resorting to symbolism or other repressive devices. The problem was projected on to a doll, and this gave the interview the objectivity of the third person. The therapist created the situation which the child faced. Cases were reported, the limitations and dangers of this method were discussed. For example, there is the danger of getting too much information

on the basis of a trick and not on the basis of rapport. This method has been found best with children from six to ten years. Of all methods it gives the quickest and the most complete picture of the child's emotional life. There is no doubt as to its diagnostic value. Blanchard (9), in the discussion which followed, objected to the terms "active" and "passive" and preferred the term "controlled play" to describe Solomon's technic. Despert (17) investigated personality differences in children of two to five years in a controlled nursery school setup. The situation and materials were constant, and different reactions were noted. In play with dolls, the child dramatized and expressed verbally his relations with his family. Despert emphasized the importance of supplementary information obtained by other means. Murphy (55) showed how in play the preschool child will indicate his assimilation of the pattern of his family experience. The literature on play as a projective technic has so far been concerned with material, the distinction between academic and psychoanalytic explanations of play, the value of the play interview, variations in the methodology (active and passive), the need for supplementary data, and warnings against the casual adoption of the method.

Rorschach

The clinical significance of inkblot interpretations was first explored in 1911 by Rorschach (64), a Swiss psychiatrist, who had in mind a technic for the differential diagnosis of the insane. The results of his studies were published in a monograph, *Psychodiagnostik*, 1921. This has never been published in an English translation. After his death in the following year, a paper by Rorschach and Oberholzer (65) was published which dealt with Rorschach's study of one of Oberholzer's patients. These writings are the basic classics in the field.

Vernon's articles (77, 78) serve as a useful introduction to the subject. He noted the increasing interest in the test and felt that it would be helpful in studies of the nature and organization of personality, character types, and mental disorders. He pointed out the dangers of the unskilled investigator and the attempt to use the test as an objective measure. He explained that the Rorschach technic is not a test but a psychodiagnostic instrument of the play technic type and depends on the investigator. Vernon suggested that the Rorschach technic is of value in vitalizing the findings of objective tests, observations, and case histories, but is not so suitable as drawing or play for younger children. Vernon indicated the need for work on the Rorschach to establish norms, reliability, and validity. Vernon gave an almost complete bibliography which was later supplemented by Piotrowski (60). In America the Rorschach technic has been studied and developed in three main areas. Klopfer, in New York City, established a group called the Rorschach Institute which publishes occasional papers in mimeographed form in the Rorschach Research Ex-

change Beck (6) in Chicago, and Hertz (28) in Cleveland, have developed scoring and interpretation procedures. Beck's book (6) is useful since there is not an English translation of the original Rorschach publication and since the method has been modified and developed. The author reviewed experiences with the Rorschach test and gave his own results. The book was written for the experienced student, technic was elucidated, and interpretation of individual responses given in detail.

Validity—Benjamin and Ebaugh (8) criticized previous attempts to investigate the reliability and validity of the Rorschach test by means of statistical methods. They made a comparison of Rorschach and clinical diagnoses in fifty cases. The results showed that the Rorschach test has a high degree of diagnostic validity. Hunter (34) examined the value of the Rorschach test as a measure of intelligence and personality by comparing, in the case of fifty pupils, intelligence as revealed in the Rorschach with the measure of intelligence given in the teacher's estimation, by the Binet and Porteus Maze tests, and by the average of these two. Personality sketches prepared from the study of the Rorschach results were compared with personality sketches given by the teachers. It was found that the Rorschach indicates the general all-round level of functioning better than the Binet or Maze tests alone.

The so-called "blind analysis" is another method of examining the validity of the test. Hertz and Rubenstein (32) stated that the ultimate test of the method was the comparison of blind analyses, where the examiners knew only the sex and age of the subject. The writers compared two blind and one partially blind analysis prepared from one Rorschach record by three experienced examiners. The study claimed extremely high agreement. Comparison of the analyses with other clinical data showed that the Rorschach technics have a high degree of diagnostic validity. Piotrowski (61) reported a blind analysis of a case of compulsion neurosis. The Rorschach record and the analysis of it are given with the patient's history and analysis of personality based on information received from the physician. Troup (75) studied twenty pairs of identical twins, the hereditary similarity being established by the Rife diagnostic formula. Six judges, expert in the use of the Rorschach, collaborated. No high degree of resemblance in temperament was found. It was concluded that the method had limitations in validity, reliability, and adequate norms. It was felt that the value of the method as a psychodiagnostic instrument depends on the skill of the examiner, but that need not interfere with its function which is not to supplant objective tests but to supplement.

Reliability—Fosberg (23) explored the retest reliability of the Rorschach results. The subjects were given the test on four occasions with different instructions: (a) standardized, (b) to make the best impression, (c) to make the worst impression, (d) examiner asked the subject to look for various things in the inkblots. The psychodiagram remained recognizably like that in the Rorschach administered in the standardized way.

Klopfer and Davidson (16) examined and summarized the Rorschach data obtained from normal children by different investigators.

There has been a steady stream of publications dealing with the refinement and elaboration of the Rorschach technic. Monnier (51), writing on the present technic of the Rorschach Psychodiagnostik Test, discussed the technic of administration and the quantitative and qualitative evaluation of the results. He believed that an intelligence test should be given first. He objected to the classification "introvert" and "extrovert" and preferred the descriptive terms "kinesthetic" and "chromesthetic."

Scoring—Hertz (30) studied three hundred high-school subjects in an attempt to increase the uniformity of procedure and objectivity of scoring. Criteria were determined for scoring various factors, and frequency tables were compiled to provide standards of normality for certain test categories. Such standardization simplified administration of the test, increased the efficiency of the examiner, and gave greater objectivity to the scoring. Hertz made a comparison of three lists of normal details for use in scoring: the Hertz list, statistically determined; the Klopfer-Rickers list, qualitatively determined; and Beck's list, empirically determined. The highest percent of agreement on this point was found between Hertz and Beck, but there is a wide range of agreement for various cards. The agreement was thought to be encouraging but there is a real need for further statistical research. Hertz studied the accepted popular response lists used by five different investigators. There was agreement, although variable factors might influence their determination. A low percent of popular responses was found in groups which showed low intelligence, neurotic trends, and behavior problems. Klopfer (39) examined the shading response and described four types giving a tentative interpretation for each type. Klopfer raised the question of the advisability of standardizing the Rorschach method and concluded that schematization would be incompatible with this method since it would tend to lessen the examiner's interest in the individual nuances and facets of any record.

Klopfer and Davidson (42) prepared a 4-page record blank which includes instructions, space for case history summary, and for the graph of personality determinants, formulas for the necessary interpretive relationships, description of refined scoring symbols, and so forth. There is also a separate sheet of photographic reproductions of the inkblots which can be used for indicating the location of responses.

Suares (73) tried to establish norms for the Rorschach responses of adolescents and to investigate changes during this period. The test was given to ninety-eight boys and girls between twelve and eighteen years. Twenty-one of the boys and twenty-one of the girls had been given the Rorschach from two to five years previously. The retest showed that the girls tended to become more extratensive at adolescence and the boys tended to become more introversive.

Miscellaneous—Pescor (57, 58) is writing a series of articles on the relationship of various personal factors to the Rorschach performance of 476 delinquents. He found that the age factor, within the range of seventeen to seventy-seven years, was of no statistical significance in the Rorschach results. Certain significant tendencies were evident such as, in the case of older men, a greater frequency of original form and human responses. The relationship between mental status and Rorschach performance was found to be insignificant. Zulliger (81) used the Rorschach test for diagnosis and prognosis in the case of youthful thieves. He claimed that the test often indicates whether a youthful thief may be re-educated or not. Harrower-Erickson (27) suggested some military uses of the Rorschach test to supplement intelligence tests in finding persons of emotional balance for positions of responsibility, to eliminate the emotionally unstable, to identify the simulator of mental symptoms, and to supplement the differential diagnosis of psychiatrists in cases of shell shock. The authors gave clinical illustrations.

Munroe (54) found that the Rorschach technic had a function in the guidance of college students: (a) in the prediction of academic failures, (b) in suggesting whether or not a borderline student has resources from which improvement may be expected, (c) in planning programs and approaches according to the need of the individual, and (d) in giving a detailed and very accurate picture of the way in which the student's mind functions. Munroe is extending her use of the test to cover the entire freshman class, the protocol being studied and interpreted as need arises in the analysis of any problem or development of a plan. There is an increasing use of the Rorschach test for diagnosis and analysis, in a wide variety of developmental and personality studies, with a recognizable emphasis on the investigation of neurotic and psychotic patients. The Rorschach test is being used in clinics and institutions as a diagnostic and analytic instrument, but as an instrument which is still in the process of being tested.

Gesture and Expression

Estes (21) reported on six experiments in which 323 judges estimated the personality of fifteen male subjects from brief motion picture records of their behavior. These estimates were validated against criteria obtained from an extensive study of their personalities. Three procedures were used in judgment, viz., rating, checklist, and matching. The results were all statistically significant but varied in accuracy with the judge, the subject, and the aspects being judged. Subjects who were introverted were least accurately judged. The conspicuously well-judged traits were inhibition-impulsion; apathy-intensity; placidity-emotionality; ascendancy-submission. Those judges who were interested in the graphic arts or dramatics

were more successful than those whose dominant interests were in the sciences and philosophy.

Handwriting

The use of handwriting in the study of character and personality persists even though much of the earlier work has been discredited as being scientifically unsound and superstitious. Of the many discussions and studies which have appeared in the period under review the two following have been retained as worthy of serious consideration. Booth (10) used handwriting as an objective technic in personality testing. This is an approach to the person from the side of the action pattern. Alten (2) referred to handwriting as the sum of crystallized gestures and an index of underlying expressive impulses. Form, size, manner of connection, slope, and pressure are criteria of the writer's taste, sense of space, temperament, and clearness of thinking. Writing permits the conscious realization of unconscious processes. Alten quoted the work of Allport, Erlenmeyer. Klages, and included a useful bibliography.

Voice

Moore (52) reported an investigation on voice and personality, using the Bernreuter Personality Inventory, self-ratings in speech, and ratings by speech students. Breathly voices were found in persons who were high in neurotic tendencies and introversion and low in dominance. The study indicated a possible relationship between types of voice quality, deficiencies, and personality traits, and the need for personality adjustment before speech therapy is possible. Caro (12) described a study comprising a half-hour broadcast of six male voices reading short prose selections, and the listeners' judgment of personality on the basis of these voices, with a report of their own personality. There was a positive relationship between self-description and listeners' estimates of radio personalities, the relationship being especially marked when the listener was a person with little education.

Dusenbury and Knower (20) used phonograph records to express eleven emotional conditions while repeating letters A to K. These representations were judged by four groups of judges. The accuracy of judgments for recorded sounds was 83 percent and for facial expressions of the same emotional state 89 percent. Women's judgments were 5 percent more accurate than those of men. Kelly (35) took advantage of the natural experimental situation found in the fact that amateur radio operators rarely meet personally the other amateurs with whom they communicate and yet they form judgments of each other's personality. A comparison was made between personality ratings based on voice and conversation alone, with ratings made by personal acquaintances. The median correlation between personal and amateur ratings in thirty-six traits was .22.

Drama

Bender and Woltmann (7) worked out the use of puppets with disturbed children and showed how children produce puppet shows according to their emotional needs; how the group and the show gave a sanction for aggression and antisocial behavior and how the children distorted the plays, in the retelling, according to their own personal problems.

Stories and Pictures

Despert and Potter (19) made a systematic study to ascertain the value of the story as a means of investigating psychiatric problems. Three tasks were required: (a) popular stories to be reproduced—"Big Bad Wolf," "Goldielocks," the story you like best of all; (b) stories made up by subject, any story you wish to make up, a story about a boy (or girl), story about a father, mother, and children; (c) story made up by physician, told by teacher, retold to teacher in writing, retold by psychiatrist. The stories made up by the subject were found to be the most provocative of all. Productivity was not considered an index of the intensity of phantasy-life. Children with lower IQ's were less productive on the whole. The boys were more productive and more aggressive, and it was suggested that there might be a positive correlation between aggression and productivity. Recurring themes were found to indicate the main object of concern or conflict. Anxiety, guilt, wish fulfilment, and aggressiveness were the main trends expressed. The phantasies thus expressed checked well with the material obtained by other means. The story approach was most valuable when complete freedom of subjectmatter was left to the child.

Balken and Masserman (4, 5, 49, 50) used the Thematic Apperception Test devised by Morgan and Murray (53) with fifty patients with various forms of psychoneuroses and early psychoses. They found that the phantasies so produced were in accord with or supplemented the clinical evaluation of the subject. The phantasies were believed to be of value in psychiatric diagnosis, prognosis, and in estimating the progress of psychotherapy. The authors believe that the test should be further investigated and elaborated as an instrument of research and as an aid in clinical psychiatry. Symonds (74) explored the possibilities of using the Thematic Apperception Test in studying adolescent personality. An analysis of the stories and pictures used for the investigation of phantasy showed that those pictures are most serviceable which have a minimum of detail, are vague in theme, incomplete in content, and suggest characters with which those telling the stories can identify themselves.

Conclusion

The development of these miscellaneous devices for studying the dynamics of personality shows that deeper motivations, enduring attitudes,

and basic needs reveal themselves in separable and observable aspects of conduct. Given an appropriate methodology, therefore, it would seem that the scope of the study of personality is co-extensive with human behavior. Projective technics are an invitation to express in overt terms of movement, feeling, or phantasy the inner dynamics of personality. Sensitive as they are to what cannot be objectively measured and subject to the impact of the examiner's personality, they often lack reliability and established validity.

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CHAPTER VII

Applications of Personality and Character Measurement¹

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IF THE PERIOD under review has been as prolific in research as the last period covered in the REVIEW OF EDUCATIONAL RESEARCH the results have not been published. A sort of routine research formula, however, seems to have become common practice—to construct or revise an instrument for the purpose of solving a practical problem, to administer it to one or more groups, and to study by common statistical procedures the scores obtained. Seldom does one come upon the development of an instrument or the utilization of a technic which shows promise of being more rewarding than the rather ineffectual procedures that have been developed in the past. It is probable that the kind of research which has been described for the most part in this chapter has reached its height and will be superseded by other forms of personality study.

Social and Religious Attitudes of College Students

College students continue to be the favorite subjects of experimenters despite many warnings that mere availability is not a satisfactory criterion for selection of groups from which generalizations are to be drawn. Gilliland (40) gave the Thurstone Attitude Scales on attitudes toward God and the church to students of three universities and three denominational colleges and found little difference between the student groups. Nelson (62) attempted to determine the prevalence of radical attitudes in four state universities and fourteen church affiliated colleges including 3,758 students. According to scores on the Lentz C-R Opinionaire, the students on the whole were rated conservative, with the women uniformly more so than the men. Harper's Scale to Measure Social Attitudes, Chant and Myers' Scale to Measure Optimism-Pessimism, Whisler and Remmers' Scale to Measure Morale, and a questionnaire of opinions about social trends in the U. S. were administered by Whisler and Remmers (101) to 150 men and 149 women undergraduate students in psychology in order to investigate group morale. These students found life satisfactory and believed themselves happier than their families. There was evidence of a slight relationship between liberalism and intelligence.

Fay and Middleton (36) concluded that the use of the Thurstone Attitude Scales will reveal reliable differences among student attitudes toward Communism, patriotism, constitution, law, and censorship, which also were found to be related to father's occupation and size of the home

¹ Bibliography for this chapter begins on page 104

town. The results of a long item questionnaire and a conservatism-radicalism test given by Lentz (54) to 409 men and women indicated, when the 100 who scored most radical were compared with the 100 who scored most conservative, that the radical group was more favorable to science and the arts, more imaginative, and more tolerant of the "underdog." They indicated less admiration for military and religious leaders, jazz entertainers, and athletes. The conservative group was more opposed to change and more favorable toward maintaining the status quo. Nelson and Nelson (63) utilized scales which they constructed to measure radical-conservative, religious, institutional, social, and moral attitudes and found some relationships among the scores obtained on those scales and the vocational choices of college students. An attitude inventory administered to 191 students by Mapheus Smith (84) indicated no significant relationship between capital punishment and attitude toward war.

Attitudes toward sex and family—Bernard (1) reported a study of the attitude of 800 university students toward sex, marriage, and the family and discussed the social implications of his results. In Brandon's study (4), 650 college students expressed their attitudes on selected phases of child development, and these results were compared with attitudes of highly trained persons in that subject. There were marked differences in a number of phases between these groups. Control and experimental groups were selected and the latter were subjected to a carefully planned learning program designed to modify their attitude. Significant gains were obtained in certain areas. A re-examination of part of the group after a period of two years indicated that some of the change of attitudes still remained.

Honesty—Bond (3) submitted a paper and pencil "honesty" test containing sixty-nine propositions and involving a possibility of 258 choices, to three hundred college students. About 50 percent of the students agreed on 57 of the 69 propositions, and on 7 of the propositions there was very little agreement. Schnepf (79) reported the results of a questionnaire appraisal of 43 practical situations concerning various phases of honesty which was administered to three hundred college students. Behavior which was commonly approved or disapproved dominated these results. The author pointed out that in actual practice their behavior would be below their "level of principle."

Emotional and Social Adjustment of College Students

McMorries (56) presented the results obtained by administering the Bernreuter Personality Inventory to 126 entering Negro freshmen at Lincoln University. The scores indicated that one-third of the freshmen were maladjusted socially and emotionally. The Bell Adjustment Inventory administered to eighty of this group indicated that one-fourth had unsatisfactory home, health, and emotional adjustments. The Thurstone Psychoneurotic Inventory was administered to 359 college students by McKinney

(55) and these results were compared with personal histories obtained from the subjects. The better-adjusted groups had more wholesome backgrounds and better "bringing-up" than the poorly-adjusted groups. After the Marlow Social Personality Inventory for dominance feeling was applied to 500 college women by Carpenter and Eisenberg (12), the Carpenter Family Background Schedule was administered to fifty subjects at the dominant extreme. The nondominant group indicated lower socio-economic status, less independence, more association with adults, girls, and older children, and less with parents. There was no correlation between dominance, nondominance, and emotional stability. Hayes (46) compared scores on the Bernreuter Personality Inventory of seventy-six women college students with their family positions. The results indicated that the fewer older siblings a student had, the less likely she was to be neurotic and the more likely she was to be self-sufficient and dominant. Those students without older siblings seemed to be less sociable, more self-confident, and less introverted. These findings are consistent with other similar studies.

The Minnesota Scale for the Survey of Opinions and the Bell Adjustment Inventory were given to 49 Jewish and 366 non-Jewish college freshmen by Sukov and Williamson (94). Results of the Opinions test indicated that of the two groups the Jewish students were inclined to be somewhat more maladjusted but the Bell Inventory indicated no significant differences. Six Bernreuter test scores were obtained for each of one hundred white and Negro college girls by Eagleson (30). In only one of the traits (self-sufficiency) was there a significant difference between the two groups. In this trait Negro girls made significantly higher scores. M. E. Smith's study (83) indicated that college students of Hawaii show more neurotic symptom scores on the Thurstone Personality Schedule than college students at the University of Chicago. The most neurotic group according to the test were those of Korean and part Hawaiian ancestry, followed by the Chinese, Portuguese, Japanese, and other Caucasians in that order. Some significance is attached to the fact that the latter two groups have most prestige on the island.

Interests, Personality, and College Achievement

From the Allport-Vernon Study of Values Test and the Thurstone Personality Schedule scores obtained from 240 college women students, Pintner and Forlano (69) concluded that there was no evidence of relationship between emotional stability and conflicting interests. Pintner and Forlano (68) also found no significant differences among the Thurstone scores for high and low groups on the values test, although the low group showed slightly neurotic tendencies. Duffy and Crissy (25) used the same Values test and the Strong Vocational Interest Blank for women (scored for ten occupations) with 108 freshmen entering a college for women. Significant relationship between values scores and Strong scores were found in a

number of cases, but the coefficients were not high. The values scores did not have predictive value for academic performance nor did scores obtained on the American Council on Education Psychological Examination. Some factor analyses of the values scores were attempted and three factors were isolated and named "philistine," people interest, and theoretical.

An interest inventory was devised by Garrison (38) and administered to 320 students at North Carolina State College. From the results of this inventory interests of engineering, agriculture, and business students could be differentiated. By giving the Strong Vocational Interest Blank to 615 upper-class engineering students, five interest scales were constructed by Estes and Horn (35) which differentiated the interests of the engineering students in the civil, mechanical, electrical, chemical, and industrial curriculums. An attempt to discover the relationship between achievement and dominance test scores revealed to Meadow (58) that there is no significant relationship. The arithmetic test was one of long division and it may not have been realistic to 125 college women. In St. Clair's study (77), the Bernreuter Personality Inventory and the Thurstone Psychological Examination were given to 688 college freshmen. No relationship between most personality traits and scholastic aptitude was found, though withdrawing tendencies seemed to be important. Drought's study (24) revealed no relationship between either the Bell Adjustment Inventory or the Wisconsin Scale of Personality Traits scores, on the one hand, and the difference between achieved grade-point averages in college and grade-point averages predicted from rank in a high-school class combined with a test of scholastic aptitudes, on the other.

Stump (93) administered the Almack Sense of Humor Test, American Council on Education Psychological Examination, the Willoughby Scale of Social Maturity, and the Allport-Vernon Study of Values Scale to ninety college students who also made self-estimates of their sense of humor. When sense of humor scores were correlated with the other tests, the highest correlation coefficients, .69 and .61, were obtained with the self-estimated sense of humor scores and the esthetic and social attitudes respectively. Height and weight were unrelated to sense of humor scores. The Terman-Miles Attitude-Interest Analysis Test was administered by Disher (20) to 556 college women in Florida. The group did not differ in masculinity-femininity reactions from women students in other parts of the country, but there was some evidence which would suggest that "as the groups became internally more homogeneous for various cultural factors, they tend to draw apart with respect to the degree of femininity in attitudes and interests."

Factors Affecting Changes in Scores

Royer's Personality Inventory was administered twice by Robertson and Stromberg (75) to the same forty-two college women within a thirty-month

period. The results indicated that most of the students were better adjusted at the time of the second administration of the inventory after they had been in college for two and one-half years. Jones (50) measured the attitudes and changes of attitudes of college students over four years of college attendance with respect to the relationships between intelligence, age, major subject, political party, religious affiliation, and liberalism. Many correlation coefficients were reported. The Brown and Van Gelder study (6) of questionnaire replies concerning emotional reactions before examination showed a peak of interference with performance just before and during the first few minutes of the examination and in the last few when some questions are unfinished. In Weber's study (100) forty-four college women of freshman grade were given the Guilford S.E.M. test, Allport A.S. Reaction Study and the American Council on Education Psychological Examination on six occasions separated by intervals of one week. The findings of this study can be interpreted as related to previous studies of Gatewood, Guilford, and Hunt demonstrating that schizophrenic patients are characterized by a high day to day variability of capacity.

Mapheus Smith (85) reported two investigations of attitudes of students in an undergraduate course toward immigration and race problems. In one study the Bogardus technic for measuring social distance was given to forty-six students upon entering the course and again at the conclusion of the course. A second study was made with thirty-five students in which the Hinckley scale was used. The conclusion drawn from both studies is that attitude toward the Negro becomes more favorable after a semester study of race relations. Dexter (19) constructed and gave an attitude test to a group of participants in a religious conference before and after hearing each of four speakers. On the whole, there was little change of attitude noted. The use of statistical analysis alone in such research was questioned by Dexter.

In a study directed by Ramseyer (70) 1,500 subjects ranging from seventh-graders to adults were given attitude tests before, and at several intervals after, viewing motion picture films dealing with the work of the Works Progress Administration and soil erosion. The showing of these pictures indicated that there were decided and persistent changes (over a two-month period) in the mean scores, with girls being more influenced by the pictures than boys. From the statistical results it would seem that percentile rank on the Ohio State Psychological Examination and stability of attitude were unrelated. Little relationship was found between information and attitude or between increase of information from the pictures and change of attitude. The subjects who were most out of sympathy with the subjectmatter of the films registered the greatest change of attitude after viewing the films. The Thurstone technic was used in the construction of the attitude tests.

A follow-up study by Dyer (29) of 101 men students included in a study begun in 1924 by the author's husband revealed that vocational interests

which these subjects expressed in college were very similar to the vocations they followed in later years. Sims' study (82) of attitudes toward the TVA is an interesting example of the use of attitude scales for the measurement of changes in public opinion. Murphy and Likert (61) published a technical discussion of methods of constructing and utilizing attitude scales and demonstrated their use in the study of radical and conservative tendencies. Darley's investigation (17) of stability of scores on twelve scales of attitude, opinion, and adjustment showed distinct group and individual changes, with measured maladjustments showing more stability than normal social activities or generalized feelings and opinions. The author's discussion of opinion stability is stimulating.

Personality Studies of Other Adult Groups

The Bell Adjustment Inventory and the Bernreuter Personality Inventory were used by Phillips and Greene (66) in a study of 173 women teachers. They found that married teachers made better adjustment scores, and that unmarried teachers obtained higher maladjustment scores as they grew older. Interests of the adjusted teachers seemed to lean toward social and out-of-door hobbies while the maladjusted teachers mentioned teaching or other work-type interests. Variability in types of response to personality questionnaires of many age, sex, and conjugal groups was studied by Willoughby (103). Dispensa (21) found no significant relationships among personality traits, metabolism, and intelligence for seventy-eight young women. Grove's analysis (44) of factors in the personalities of mothers whose children had been brought to the Worcester Child Guidance Clinic suggested that ability to carry out plans, ability to make adjustments, satisfactory marital adjustments, affection for the child, absence of inferiority feelings, adequate social interests, lack of anxiety, and satisfaction with present conditions, were important factors in determining the treatability of mothers.

A questionnaire intended to measure "general over-all job morale" produced higher morale scores for selling employees than for the nonselling groups; also, morale scores decreased with increased length of service, according to Kolstad (52). An interesting study of personality patterns of village residents by the cluster block analysis method was reported by Schanck (78). The Bell Adjustment Inventory was given by Pallister and Pierce (64) to Scottish workers, to unemployed, and to college students in a Scotch industrial area. Scores were compared with the American norms obtained by Bell. The Scottish groups scored higher in home and health adjustment and lower in social adjustment than the American groups. Bills' findings (2) that scores on the insurance agent and real estate keys of the Strong Interest Blank were closely related to success after one year of selling insurance suggested that the Strong keys have some validity in this area. In a study by Hilgard (47) it was found that the Strong Voca-

tional Interest Test was a poor indicator of grades in probationary nursing courses and of ratings on practical work in the wards, for nurses in a San Francisco hospital. For such predictions intelligence test scores were more useful than interest test scores, though low interest scores predicted those who would leave training in spite of their ability to do the intellectual work involved.

Personality Studies of Adolescents and Younger Children

A personality test constructed from items of the Bernreuter and Cowan tests was given under the direction of Sheehy (81) to 777 boys and girls between the ages of nine and sixteen. Definite personality traits were found that developed with age. There was also marked agreement between pupil self-estimates and obtained case histories. Questionnaires concerning social adequacy and activity and the Willoughby Personality Inventory were used by Engle (34) in a study of 106 high-school boys and girls having a mean age of about fifteen. Although the reliability of the data was questioned by the author, it was found that pupils who have a great deal of social and date activity are better adjusted than others. Four aspects of the development of self-reliance were reported by Stott (91). A group of high-school and college students were matched by Engle (33) on several criteria (grade, sex, school marks, IQ) but chronological ages of each matched pair at the time they entered high school or college were kept at least two years apart. The Cowan Adolescent Personality Schedule, a social activity questionnaire, and interviews given to this group did not reveal any significant differences in the two groups except that those pupils who believed that they were handicapped by acceleration were more mal-adjusted than the others. Two groups of children aged nine to fifteen were given the Brown Personality Inventory for Children by Springer (87). One of the groups (327 subjects of both sexes) which came from homes of low socio-economic status showed significantly more instability than the other group (473 boys and girls). No significant relationship could be obtained between high neurotic scores and sex, chronological age, score on the Good-enough Drawing of a Man Test, or parental ratings on the Barr Scale of Occupational Status.

The Yepsen Adjustment Score Card was used by Durea (28) to rate 1,838 children from elementary school through high school during each of six consecutive months. No significant differences of any kind were revealed in the adjustment of any comparable groups such as the sexes or races. In a study of one hundred children of borderline and above borderline intelligence, Wile and Davis (102) found that both groups were equal in the number of personal problems and difficulties, but that the superior group could adjust itself more readily. A comprehensive personality study by Stott (92), involving about 1,855 adolescents from farms, towns, and cities, revealed that the city group received the best ranks on Maller's In-

ventory and other personality scales. The town group ranked lowest. Horowitz and Horowitz (48) made an intensive study of the social organization of a small rural community in the South and studied social attitudes by means of tests and interviews. The chief finding was that social development is not closely related to mental development. Other findings and the methods used in this study are worth consideration by workers in this field

A questionnaire study of economic interests of adolescents by Symonds (95) revealed that school children of high-school age are more interested in earning than in saving or spending money. Finch and Odoroff (37) used the Strong Vocational Interest Blank for Men to study the interests of 467 boys and girls in junior and senior high school. The results confirmed the evidence of Carter and Strong that vocational interests of the two sexes show certain marked differences. The interests measured by the Strong blank were well developed prior to age fourteen. Gregg (42) listed the interests of Negro boys and girls in mixed and separate schools and suggested that the development of these interests depends to some extent on the kind of school attended. Stagner's study (90), by means of personality tests, attitude scales, essay autobiographies, and personal interviews of the relationship between emotional instability and attitude toward parents, seemed to show that emotionality determines attitudes. Several hypotheses concerning the source of emotionality and attitudes were suggested

In a study by Thorndike (96) forty-nine gifted boys and girls filled out the Pressey Interest-Attitude Test. The scores obtained corresponded more nearly to mental age than chronological age. They indicated maturity in absence of fears and worries but they showed less maturity of judgment in interests than normal children. A study by Van Alstyne and Hattwick (99) presented a comprehensive analysis and follow-up, with numerous behavior rating scales, questionnaires, social case histories, and so forth, of 165 children who had attended the Winnetka Nursery School. A comparison (in post nursery school life) of one group who showed good adjustment and one with less effective adjustment indicated that the less-adjusted groups had shown markedly more indication of poor adjustment in nursery school than had the well-adjusted group. A great deal of evidence was presented to indicate that the nursery school makes for better social and emotional adjustment. A half year interval analysis of the behavior and personality traits of children whose ages ranged from two to four and one-half years was reported by Hattwick and Sanders (45). Generalizations were drawn concerning the ages at which control, experimentation, integration, fanciful thinking, and the increasing role of social influences appear. Roberts and Ball (73) described a series of rating scales developed by Thurstone's method for the measurement of attitudes involving nine different aspects of personality. Attitude scales administered to 1,357 children in Grades IV to VIII by Tschecthelin and others (98) revealed no relationship with chronological age, mental age, or grade.

Problem and Delinquent Children

In a study by Gerlach (39), the Stanford-Binet and the Cornell-Coxe Scales were given to sixty-one maladjusted boys between the ages of nine and twelve who had no mental diseases, were nondelinquent, and in good health. Children of the aggressive type were superior in intelligence ratings and obtained better scores on performance tests. The Marston I-E Scale, a Behavior Problem Record, and a Behavior Rating Scale were used by Durea (26) to measure ninety-three boys and girls in the first four grades to discover the effectiveness of the ratings in locating maladjusted children. The Loofbourow-Keys Personal Index of problem behavior yielded low bi-serial coefficients with ratings of advisers in junior high schools. Riggs and Joyal (72) attributed these results in part to the lack of validity in the ratings. Burt (10) made an elaborate study of eleven traits of emotionality of 500 children referred for criminal or nervous peculiarities. Factor analyses by several methods seem to isolate the factor of general emotionality and the two factors of aggressiveness and unpleasant emotion. The relationship between temperament and physical traits was not high enough to allow estimation of one from the other.

Durea (27) attempted to discover personality traits which would differentiate individuals with the lowest and highest degrees of delinquency. The Pressey Interest-Attitude Test revealed definite differences among the various groups as regards circumstances considered wrong, fear and anxiety states, things in which interested, and traits admired in others. The Vineland Social Maturity Scale was administered to ninety-one delinquent boys by Doll and Fitch (22) and indicated that nondelinquents were definitely higher in social competence than the delinquents but the factor of mental retardation might account for some of the difference. A technic for determining the degree of maladjustment of institutionalized male defectives was presented in a report by Brooks (5). Low positive coefficients were obtained when Horsch and Davis (49) computed the correlation between institutional demerits for misconduct and Bernreuter Personality Inventory scores. Administration of the Thurstone Personality Schedule to 115 youthful first-offending prisoners by F. Brown (7) resulted in scores which were higher than college students' and closer to schizophrenic, manic-depressive, or neurotic scores.

Effects of a Handicap on Personality

The Maller Personality Scale was administered by Seidenfeld (80) to 50 tuberculous and 50 nontuberculous subjects who were paired according to a number of different categories including intelligence, age, and sex. Fifteen of the items showed significant differences between the two groups.

A study by G. Brown (8) of 60 diabetic children and 60 of their nondiabetic siblings revealed no significant differences in general health, school

achievement, intelligence test scores, and Woodworth-Cady scores. Parents, however, reported increased excitability and irritability of the diabetics after the onset of the disease. The Pintner Personality Outline, a questionnaire, and an intelligence test, were used by Chobat and others (13) in their study of 169 allergic children. The girls in the group seemed to be better adjusted than the boys, and the whole group showed a slight tendency toward introversion and submission. Intelligence tests indicated no deviation toward retardation or acceleration.

A study of adjustments of blind and seeing adolescents, reported by P. A. Brown (9), indicated that when the Neymann-Kahlstedt Diagnostic Test (Introversion-Extroversion) and the Clark Revision of the Thurstone Personality Schedule were administered to 359 seeing high-school seniors and 218 blind adolescents (from ages sixteen to twenty-two) no significant differences except in individual items were found. According to findings by Springer and Roslow (89) from the Brown Personality Inventory used with 59 paired deaf and hearing children, the deaf children obtained much higher neurotic scores than the hearing children. However, when items specifically conditioned by the loss of hearing were eliminated there was no appreciable difference between the two groups. Another study by Springer (88) found little difference between deaf and hearing children in teacher ratings on the Haggerty-Olson-Wickman Behavior Rating Schedules. Kirk's study (51) of ratings on the Haggerty-Olson-Wickman Behavior Rating Schedule of 112 children in Grades I to VIII who were either deaf or hard of hearing suggested that normal hearing children have less "problem tendencies" than the deaf and hard of hearing groups. Little difference was found between the groups in intellectual and physical traits, and considerable difference was found in emotional traits. When the deaf and hard of hearing groups were compared with each other no significant differences were found. The subjects in Gregory's study (43) consisted of institutionalized mentally retarded children between the ages of thirteen and eighteen. They were divided into two groups—those who were deaf and those who could hear. They were then paired off as to age and sex and given a personality test. The deaf children seemed to feel insecure and withdrew from social situations.

Personality and Various Factors

Pillsbury (67) showed that body form of 274 students as measured by the Pinget Index, and introversion-extroversion as measured by the Guilford Questionnaire, are not related despite the use of every type of statistical analysis which might be applied. Cabot (11) used subjects of the Harvard Growth Study to examine the relationship between personality and physique (pyknosomes, leptosomes, and athletosomes). The results are typical in revealing no useful relationships among somatic types and personal characteristics. Darling's investigation (18) of the relation be-

tween personality traits and autonomic reactions to startling sensory stimuli leads to a hypothesis of relationship between personality structure and autonomic functioning. Gottlob (41) studied the electro-encephalographic patterns of subjects classified as extroverts and introverts; extreme extroverts were characterized by unusual rhythms. It is suggested that the personality pattern and rhythm patterns are not causally related but are concomitants in an organismic whole. Claims that the lie detector test is valuable in dealing with personality problems, since it detects deception and thus clears the ground for readjustment, are made by Marston (57). It is also claimed that the more extensive use of the test will furnish a motive for moral education since there will be less dishonesty if its detection is more likely.

Eisenberg (32) selected fifteen subjects of each sex who were at each extreme of dominance feeling, and ten judges examined their handwriting. Judgments concerning personality were no better than chance expectation while judgments as to sex were a little better than seven out of ten.

Drake and others (23) found slightly more relationship between self-rating by the Link Inventory and rating by classmates for boys than for girls, although none of the correlations was highly significant. The Roger Self-Rating Test scores of thirty-nine college girls and ratings obtained by their best friends did not show any consistent tendency for the self-ratings to result in overestimation of desirable characteristics, as reported by Robertson and Stromberg (74). Copeland's study (15) compared reported measurements with actual measurements of height and weight, and showed that there were enough differences to warrant serious doubt concerning the validity of reports obtained from applicants for employment. A tendency to make false reports of age was also noted. Spencer (86) showed that the use of self-rating questionnaires for the discovery of conflict is not likely to be effective when students are required to sign their names. When conflict is greatest deception may be high.

Koos' discussion (53) of observation, questionnaire, and rating technics, and their use in the study of personality adjustments and vocational guidance, sums up some of the major issues involved in the use of these methods of appraising personality.

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CHAPTER VIII

Statistical Methods Related to Test Construction and Evaluation¹

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THE DEVELOPMENT AND APPLICATION of statistical methods to problems of constructing tests and interpreting the scores from these tests have progressed rapidly since the pioneering work of such men as Galton, Pearson, Thorndike, and Spearman. However, it is clear to those working on these problems that far from having reached a plateau this development is still in a period of rapid growth. The recent progress is chiefly marked by the substitution of more efficient and rigorous procedures for the crude empirical methods which sprang up during the rapid development of this field. The prediction of even greater gains in the near future is based on the relevance for these procedures of certain rapidly developing branches of statistical theory which are associated with factor analysis and analysis of variance. The rapid growth in these fields is abundantly demonstrated by a tabulation of the number of references related to these topics included in the last three numbers of the REVIEW OF EDUCATIONAL RESEARCH which have been devoted to Psychological Tests. Toops and Kuder (166) mentioned 14 studies related to factor theory and 4 studies on analysis of variance and covariance in their 1935 review. In 1938 the chapter by Cureton and Dunlap (33) reported 28 studies on factor theory and 14 studies employing analysis of variance. Included in the bibliography for the present chapter are 48 studies concerning factor theory and 19 references related to analysis of variance.

Bibliographies, Textbooks, and General Discussions

This review continues the corresponding summary on statistical methods by Cureton and Dunlap (33). Mention should also be made of the review of general educational statistics by Johnson (80) published in the REVIEW for December 1939, and the summary by Dunlap (42) published in another journal. Lindquist (100), Wert (178), and Van Ormer and Williams (172) have published books on elementary statistics. Books which cover somewhat more advanced topics include Snedecor's revised edition (146) which is principally devoted to the application of Fisher's analysis of variance to biological problems, Lindquist's more recent work (101) which is important as the first book to present a detailed exposition of the application of these methods to educational problems, and Peters and Van Voorhis' revision (129) of their earlier book, which might be described

¹ Bibliography for this chapter begins on page 123

as an attempt to bring the materials of Kelley's classic *Statistical Methods* up to date by including sections on newer topics. Two new books with less of an applied point of view are those by Rider (135) and Mises (114).

There has been a noteworthy trend in the teaching of statistics toward increasing the emphasis on understanding and appreciation as compared with the development of computational skill. Two examples of this changing point of view are the student workbooks prepared by Lindquist (102) and by Dunlap (44). Otis and Durost (126) prepared a pamphlet on the application of statistical methods to test scores. A short discussion of elementary statistical methods was written by G. M. Smith (144). Holzinger (70) wrote a chapter for one of the yearbooks in which he gave in fourteen pages an overview of the development of statistical methods from early work on averages and the normal curve to present-day factor analysis. The report of the most recent international Conference on Examinations edited by Monroe (115) provided interesting discussions of technical problems of examining. Two important sources of information concerning books on mental measurement or research and statistical methodology are the volumes edited by Buros (14, 15). About half of the former and about a fourth of the latter are devoted to reviews of books.

Factor Theory: Summaries and Points of View

Recent journals have contained a constantly increasing number of articles concerning factor analysis. New developments, disagreements among the leaders, mathematical complexity, misuse of the procedure by new disciples, and the lack of much tangible evidence concerning the utility of the technics have combined to make the topic a source of discussion as well as humor, as evidenced by Cureton's paper (32). However, factor analysis has reached the stage where summary treatments and general reviews have begun to appear. Thomson's book (156) reviewed and contrasted the various procedures. Holzinger and Harman (74) outlined briefly in this journal the principal types of factor analysis and now have a general book in press.

Thurstone in a recent review (162) of current issues discussed a number of criticisms and set forth certain basic conceptions. The fundamental postulate upon which his work rests is that "mentality . . . functions in terms of differentiable processes which do not all participate with equal prominence in everything that mind does" (162:204). He emphasized that factor analysis is not the last word but is rather exploratory in character:

The new methods have a humble role. They enable us to make only the crudest first map of a new domain. But . . . [they should] enable us to proceed beyond the factorial stage to the more direct forms of psychological experimentation in the laboratory. I fear that this exploratory nature of factor analysis is often not understood (162:190).

With reference to the nature of factors, he stated:

The factor methods involve no assumptions whatever as to the nature of the factors. They may be physical or psychical, native or acquired, physiological, chemical, or social in character. They may have a significance only for the particular group investigated (162, 195-96).

Elsewhere (164: 235) he stated:

The mental faculties isolated by the factorial methods are probably not ultimates. They will surely break down into further elements.

Wolffe (186), in the latest general discussion of factor methods, stated:

Factors are produced by anything that introduces correlation into a set of variables.

There are as many causes of factors as there are causes of correlation. If the subjects show considerable heterogeneity in education, in experience, or in cultural background, factors attributable to these differences will appear (186: 25). . . . Factors are not artifacts; factor analysis does not create them. Each factor indicates the operation of some systematically working cause or set of causes (186: 26).

Wolffe's treatise is predominantly interpretative and nonmathematical. It includes a bibliography of 530 references, covering the years 1928-1940. An outstanding event of the recent period was the symposium on the factorial analysis of ability under the auspices of the British Psychological Society. The papers of the participants, Thomson (154, 155), Spearman (147), Burt (17), and Stephenson (150), have since been published and provide an excellent outline of current issues, particularly as related to British factor theory. They reported that although the "tetrad difference" of the four participants had not been found to vanish completely, some of the "disturbers" of unanimity had proved not to be "significant."

Factor Analysis: Technical Developments

An outstanding example of the power and utility of factorial methods is provided in two recent papers by Kelley. The first (83) contained a general discussion of the importance of the quantitative study of mental traits in a democratic society. In the second (87) Kelley proposed finding the activities which would yield the greatest happiness to the largest number and at the same time produce the greatest amount of that which society needs. The mathematical solution of the problem was shown to be an extension of Hotelling's canonical correlations to the case of originally weighted variables. A timely illustration of the pertinence of the solution to the problems of classification occasioned by the Selective Service Act was presented. Thurstone (163) presented a new method for the rotation of axes to obtain what he has termed "simple structure." Burt (16) presented a discussion of his method of analysis by sub-matrices sometimes called the group-factor method. He also contributed a discussion (18) of "unit hierarchies," the use of which he believes facilitates the solution for principal components. Another computational procedure for obtaining principal components was reported by Flood (58). He made no

comparisons of the time required by his procedure as compared with other available methods but it appears that it might be considerably longer, especially when the number of variables is large.

Many methods have been suggested for determining the smallest number of factors which will account for a matrix of correlation coefficients. Two recent contributions on this point are those of Hoel (69) and Young (189). Wilson and Worcester discussed the conditions necessary for a solution to be obtained in resolving five tests into two general factors (185) and six tests into three general factors (184). Two methods of extending the results of previous solutions to new data have been presented by Harman (65) and Mosier (117). Thomson (153) developed a simplified method of estimating a specific factor and Ledermann (97) reported a method which is shorter than other procedures when the number of tests is considerably greater than the number of factors. Ledermann (98) also provided the general solution for finding another matrix which leaves the relation of the correlation matrix and the factorial matrix unchanged and also preserves the matrix of factor loadings. Tucker (169) gave a detailed description of a method for finding the inverse of a matrix. A method of making an initial transformation designed to assist in rotating to "simple structure" was discussed by Landahl (95). In a series of papers (96, 157, 159) Thomson and Ledermann discussed the influence of univariate and multivariate selection on the factorial analysis of ability.

Criteria for selection of methods—There have been a number of discussions of the problem of stability or invariance of factor loadings. Young and Householder (190) suggested invariance was an important criterion for evaluating a system of factor analysis. Mosier (118), Harsh (66), and Cox (28) reported that the method of rotating to "simple structure" provided such stability; Holzinger and Swineford (75) reported similar stability for the bi-factor method; and Humphreys (77) disputed Smart's conclusion that Thurstone's centroid method of principal components did not provide stable values. On the other hand, Wilson and Worcester (183) questioned the meaningfulness of factors obtained from the method of principal components. In a reply Kelley (82) defended this procedure. In a later discussion Kelley (87) attacked the validity of the criterion of invariance, and suggested that a set of mental factors proposed for general use should aid in the understanding of distinctions which are important in the lives of people and in the processes of society, and that the criteria for judging a set of factors should be the degree to which they accurately, fully, and economically facilitate this understanding of social living in its dual aspect of individual and social welfare. The difference in point of view revealed by these discussions is important and serves to emphasize the little appreciated fact that various individuals are using factorial methods with different immediate purposes. To suggest that one procedure is best regardless of the purposes of the investigator would appear to be naive. Criteria for the selection of factor methods were listed and discussed by Holzinger (72).

Verification and application—Interesting work has been done by Holzinger (71) and Holzinger and Harman (73) in comparing the results obtained from the multiple factor methods with those found by means of the bi-factor technic. Although differing in detail these results are notable for the similarity of their general findings. Spearman (148) reworked Thurstone's Primary Mental Abilities data and found them full of "g"; meanwhile Blakey (11) re-analyzed, by means of Thurstone's methods, the famous test of the theory of two factors by Brown and Stephenson and obtained four general or group factors. In two studies (29, 108) it was reported that the method of principal components would not do what Thurstone's multiple factor methods were designed to do. A discussion of "inverted factor theory" was presented in a joint article by Burt and Stephenson (19) in which points of agreement and disagreement in their views were noted. Another interesting approach to factor problems, the analysis of the causal systems underlying the variation in one dependent variable in terms of "basis variates," was discussed in an article on confluence analysis by Mendershausen (113). Some relations between multiple correlation and factorial values were discussed by Guttman (64) and Dwyer (47). Tucker (170) discussed correlated factors and ways in which a general factor might operate. Numerous applications of factor methods have been reported in earlier chapters of this issue.

Analysis of Variance; Tests of Significance

The development of the theory of testing hypotheses has continued. Contributions to the problem of analysis of variance and co-variance in multivariate problems were made by Wilks (180) and D Bishop (9). Finney (50), Pitman (130), and Morgan (116) presented tests for the significance of the difference between the two variances in a sample from a normal bivariate population. Tests of significance of the differences between regression coefficients derived from two sets of correlated variables were described by Yates (188). A discussion of analysis of variance tests was presented by Tang (151), including tables of the probability of failing to reject a hypothesis when a second hypothesis is true. Pearson (127) and Neyman and Pearson (124) discussed combining independent tests of significance and general aspects of the testing of statistical hypotheses.

Of more interest to educational workers are the discussions of the application of these methods. The books of Snedecor (146), Lindquist (101), and Peters and Van Voorhis (129) were mentioned earlier. Two monographs deserve special mention—J. H. Smith's survey (145) of tests of significance and Jackson's discussion (78) of applications to education. Dunlap (39) and Crutchfield (31) also discussed applications to educational and psychological work, and Shen (141, 142) contributed two important papers. Deemer (34) provided an example of Shen's generalized

formula for testing experimental treatments. H. M. Walker (176) discussed the general problem of testing a statistical hypothesis. The "epsilon technic" was the name given by Peters (128) to a test of significance involving Kelley's unbiased correlation ratio and resembling very closely analysis of variance. The thorough discussion of the concept of degrees of freedom by H. M. Walker (175) should prove of value to many who have had difficulty in interpreting the treatments of the English writers.

Correlation Formulas and Computational Methods

Although many procedures have been presented for the calculation of partial and multiple correlation coefficients and regression coefficients, the methods described by Wren (187) and by Chauncey (25) appear to be economical. Chauncey reported obtaining the multiple correlation coefficient for a six-variable problem in thirty minutes with the aid of a calculating machine. Wherry (179) reported two methods of obtaining approximate multiple regression coefficients. Kuder (94) developed a method of calculating intercorrelations from the International Test Scoring Machine—a method which appears lengthy but is of theoretical significance. Flanagan (56) reported a note on using the test scoring machine to calculate the standard error of measurement and reliability coefficients. Dunlap (40) described the use of tabulating machines for estimating tetrachorics, and Hayes (67) presented a table for obtaining tetrachorics and their probable errors from the percent differences in groups. Hayes (68) also criticized an earlier study of the interrelations of the votes of legislators and proposed the use of tetrachoric correlation and factor analysis.

Flanagan (54) reported a short method of estimating the product-moment correlation coefficient from data at the tails of the distribution. In a previous study (53, 55-60) he had provided tables based on cases beyond one standard deviation above and below the mean, i.e., using approximately 16 percent at each end. The recent table, however, utilizes the upper and lower 27 percent of the distribution since that has been reported by Kelley (86) as optimal for upper and lower groups in the study of test items. Mosier and McQuitty (122) presented similar charts but based on the upper and lower 25 percent and the upper and lower 50 percent. It has been shown by Flanagan (55) in an unpublished paper that the use of upper and lower 50 percent groups, which is equivalent to the estimation of tetrachoric correlation coefficients, produces coefficients which are significantly less accurate than those obtained from upper and lower 27 percent groups, in addition to requiring almost twice as much tabulation time. It thus appears that many recent workers who have turned to tetrachorics as a short cut could have saved considerable time and obtained more accurate results had they used a smaller portion of their data.

A new measure of rank correlation was developed by Kendall (88). It was reported that the sampling distribution of the new measure is normal, which is not true for Spearman's ρ in the case of small samples. Since the new measure is also more easily computed than the latter, Kendall, Kendall, and Smith (89) suggested that the new measure might well replace that value in obtaining correlation coefficients from ranked data. Another suggestion for the computation of the correlation between ranks when they are expressed as percentile ranks was made by Bennett (6). In plotting the scatter-diagram he suggested that class-intervals be chosen in such a way as to normalize the data. Thorndike (160) warned that high correlations between the average of a group and another variable do not necessarily indicate high correlation between individuals and the other variable. A simplification of Thomson's formula for the corrected correlation of initial scores and gains was given by Zieve (191).

Other technics—Illustrations of the use of Fisher's discriminant function were furnished by Travers (168) and by Lorge (105). Wilson (182) warned of the limitations of the formula for the sampling error of the median. The value of stratified sampling has long been realized by many workers but persons employing this method have been handicapped by the lack of an adequate theoretical treatment of the topic. This has recently been supplied by Neyman (123).

A number of notes on shortening computational procedures have appeared. Among these are Zubin's methods (12, 192) of determining the significance of differences between frequencies; a variant of these methods by Casanova (23); a short cut for the Chi-square test for "Goodness of Fit" by Du Bois (37); and a summation method by the same author (38) which appears to be a real time-saver in computing means and standard deviations. A useful abac for obtaining the mean deviation of the area under a segment of a normal curve was provided by Dunlap and DiMichael (45).

Basic Statistical Tables and Calculation Devices

Kelley's new statistical tables (84) replaced and extended the Kelley-Wood tables of the normal curve values, which have been out of print for some time. Conrad and Krause (26, 91) prepared normal curve tables based on probable error units instead of standard deviation units. Enlow (48) reported on his statistical slide rule giving average times for solving various statistical formulas with this device. Otis (125) prepared improved forms of normal percentile charts.

Studies of Types of Tests and Test Items

Weidemann and Morris (177) reviewed the essay-type test and concluded that though much research is necessary to discover how to overcome its current faults there is a definite need and place for improved

essay tests. Ashburn (3) added one further study to the accumulated evidence that essay-type questions are not usually rated in a manner which will give consistent results even for the same rater. Jones (81) emphasized that the fact that two examiners agreed closely in marking essay examinations could not be considered evidence that their marks were based on anything of importance or were accurate appraisals of the examination. A low correlation however constitutes incontrovertible evidence that the different raters are not appraising the examination accurately.

Andrew and Bird (1) confirmed the general finding that if the factors of time per item and item-difficulty are not controlled the completion of recall type items are superior to the multiple-choice or recognition type items as written by the average college teacher. In another study (2) these investigators showed that recall items are slightly more stable than other types though all types were found consistent in their differentiation of students from one administration to the next. Carter and Crone (22) found that new-type tests can be shortened and at the same time improved through a simple technic of item study and revision. They also reported that differences in the relative reliabilities of parts are not ordinarily sufficiently large to make possible an increase in the reliability coefficient of the total by removing the least reliable part. Cronbach (30) suggested the need for further study of the multiple true-false item. Gray (61) reported some success, notably in the field of language usage, in administering tests by means of phonograph recordings.

In the field of personality measurement Rundquist (137) reported that form of statement influences response and that items, agreement with which indicated an unfavorable position with respect to the trait under consideration, were most valid. Lorge (104) found that endorsed or accepted statements (in an attitude scale) have a higher degree of internal consistency than rejected statements. Preference type of items were found by Kuder (93) to give consistent results even though used in quite different forms (paired comparison and rank-order). An interesting device intended to reduce "halo" effects in trait ratings by asking the rater to compare the traits within an individual, one with another, rather than comparing him with other persons, was presented by Lombardi (103). Further discussion of test construction in the field of personality measurement appears in Chapter V of the present issue.

Item Analysis

A few years ago test-makers were deluged with methods for selecting the best test items. It was fashionable to work out some new function of the difficulties of the items in an effort to get a method superior to the formulas of various colleagues. Fortunately, the testing movement seems to have outgrown this stage and it is now clear that precise mathematical solutions exist for the various problems of selecting or weighting items.

Some time ago Toops and Royer (167) pointed out that problems of item-selection and item-weighting were essentially multiple regression problems. The use of the ordinary regression methods, however, is prohibitive in working with a large number of items. A few years ago Flanagan (53: Chap. 4, 57) developed a short successive approximation method for the solution of multiple regression equations and similar prediction problems which enabled the test constructor to obtain in a reasonable length of time either the "best" possible combination of test items for the purpose at hand or as close an approximation as he wished. Richardson and Adkins (134) have proposed, as a short method of selecting test items, use of the regression coefficient indicating the weight which should be assigned the item when taken in combination with the total test to predict the criterion. Although such a procedure will not insure the selection of the "best" possible combination of items, it is the first step to be taken in approximating such a solution. The successive repetition of a procedure such as this was what was proposed by Flanagan as a method for obtaining the exact solution. In practice, however, it has been found that this one step beyond the first approximations (given by the correlation of the item with the criterion) adds but a negligible amount to the validity of the combination of items selected.

A discussion of general considerations in the selection of test items has been given by Flanagan (54). In this connection, the methods of correlation, discussed earlier, which devolve upon the cases in the extremes of distribution of test scores, are applicable. D. Walker (174) reported an empirical study of the effect of the shape of the distribution of item-difficulties on the shape of the distribution of scores. It would seem that considerable light might be shed on this problem by writing out the formulas for the moments of the distribution of scores as functions of the sum of the items of which it is composed. A new "index of discrimination" for "evaluating test items" was added to the list by Barry (5). Diamond (35) suggested the use of the typewriter in tabulating data as a substitute for punched-cards when they are not available. In an interesting paper Lev (99) applied the method of analysis of variance to the problem of the evaluation of test items. Baker (4) published a detailed illustration of Lev's method. Although it may be desirable to explore this procedure further, it seems clear that the problems of item-selection are essentially problems of correlation and prediction and that the appropriate statistics are therefore measures of degree of relation and not tests of significance.

Units, Scales, and Scaling Methods

The problem of units of measurement has long been a troublesome one in the field of psychological and educational measurement. Recently certain critics, notably B. O. Smith (143) and May (112), have argued that measurement in the fundamental sense in which the term is used in the

physical sciences is not possible with present instruments for appraising psychological and educational behavior. Smith gave the impression that the whole effort at measurement in the field of human behavior had been rather futile and could not amount to much until the criteria for scientific measurement were fulfilled. There was a trace of this attitude in the discussion by May. In a later discussion, however, May (111) suggested that it might be more appropriate, in the present stage of testing in this field, to judge the instruments in terms of engineering standards rather than standards of pure science. From this point of view, instead of having some "ten tests of measurement" involving various mathematical and logical points, only one "test" was needed, namely: Does the test serve the function that it was intended to serve? Flanagan (52) discussed the nature of units, and also the advantages and disadvantages of various types of scores now in use, in his report of the development of a system of scaled scores for the Cooperative Tests. He also adopted a criterion of utility as the major consideration. Scates (140) some time ago pointed out that even in the physical sciences measurement often does not depend upon equal units, a known zero point, and so forth.

A novel and interesting approach to the problem of a metric for mental functions has been reported by Gengerelli (60). This work is too new to pass judgment on but the novelty of the approach should be stimulating regardless of the final evaluation made of the specific studies and procedures reported. Lundberg (107) discussed the general problem of scaling and the measurement of attitudes; Lorge contributed a paper (104), discussed earlier in this issue. Dunlap and Kroll (46) presented evidence that placing statements in order of scale value and instructing the individual to check three items only, simplified the scoring without greatly affecting the scores obtained. A discussion of the wide variety of uses made of the Thomson method of scale calibration in developing, scaling, and studying the Vineland Social Maturity Scale was given by Bradway (13). The abac by Dunlap and DiMichael (45) is useful in scaling.

On the basis of an empirical study, Champney and Marshall (24) reported that reading graphic rating scales to millimeters (a 100-point scale) gave higher reliability coefficients than were obtained when the scale was read to the nearest centimeter (a 10-point scale). Guilford (62) compared the median values of the judgments assigned on rating scales with the values obtained from these judgments by three scaling methods. The relation between the medians and the estimates obtained by the other methods was found to be nonlinear. The author was in doubt as to the implications of this finding. Guilford and Jorgensen (63) discussed the problem of normalizing ratings. Urban (171) discussed the method of equal-appearing intervals as a scaling procedure. Two simplifications of Thurstone's method of successive intervals have appeared recently, one by R. Bishop (10) and the other by Mosier (119).

Problems of Weighting

The problem of selecting the "best" weights to assign to each of several different measures when combining them so as to predict some criterion variable has been solved, at least for the case of linear combinations. The question as to the most appropriate weights for use when a combined score is desired and no criterion is available has, however, only recently attracted attention. A thorough discussion of this problem was provided by Wilks (181), who proposed three methods of assigning weights. The first of these was previously advocated by Horst (76) who suggested the use of the first factor loadings obtained from Hotelling's method of analysis into principal components. The second method was the equalization of the correlation of each variable with the total or combined score. The third method involved the equalization of the increments of variance for the combined score as each variable is combined with the remaining variables. The mathematical procedures for obtaining these weights were described. Still another method has been suggested by Thomson (158), namely, the use of Hotelling's canonical correlations to obtain the maximum correlation of the combined scores with a combination of scores obtained from independent measurements of the same traits. Kelley (87) discussed certain important problems of weighting, including a comment on Thomson's proposal on weighting for maximum reliability. Kelley's point seems of general applicability, namely, that the weights assigned should depend upon the purpose in combining the variables.

Two empirical studies of weighting have appeared recently. Stalnaker (149) concluded from studies of the correlations between total scores obtained by rather dissimilar weightings of the parts of various College Entrance Examination Board tests that any influence of the usual weighting factors is so small as to be insignificant. Scates and Fauntleroy (139) studied the effect of weights on index numbers; the conclusions, however, seem relevant to other weighting situations. Unlike the study by Stalnaker, this one found that weights did make a difference. Some of the factors determining the effect of weights were listed.

Reliability Coefficients; Accuracy of Measurement

For some years the reliability coefficient has been the most popular method of reporting the accuracy of measurement of a test. Ambiguities arising from this procedure have frequently been noted and many comparisons have been made of the results obtained from various methods. Read (131) recently reported that changes in the method of splitting the items within the parts of a test into halves had little effect on the reliability coefficients obtained except that because of the effect of time limits it is not advisable to compare the first half with the last half. An empirical comparison of reliability coefficients obtained from test-retest,

split-half, and the equivalent forms methods by Remmers and Whisler (132) showed that different values may be obtained from these methods. A similar finding was reported by Ferguson (49), who made a factor analysis of the half-test scores from three equivalent forms. The effect of such inconsistencies on the correction correlation coefficients for attenuation, and on partial correlation, were discussed by Thouless (161), and appropriate correction procedures were provided. One will find this discussion profitable.

Rulon (136) reported a simplified procedure for determining the reliability of a test by split-halves which was similar to the method of Otis and Knollin. Flanagan (51, 52) reported the use of this type of calculation to obtain standard errors of measurement at various score levels for a given test. He also discussed the sources of ambiguity in obtaining estimates of accuracy of measurement. In another publication, (56) he suggested a short-cut for obtaining the data for such values or for reliability coefficients when the tests were scored on the International Test Scoring Machine. Mosier (121) gave a brief discussion of the concept of the variability of an individual score.

An interesting new development in the calculation of reliability coefficients of the split-halves type was given by Richardson and Kuder (133). The one of the four formulas developed which they recommend is reported to require about the same time as does the split-halves method and has the advantage of providing a unique solution. The authors pointed out that the method has all the other disadvantages of the split-halves procedures and assumes the rank of the matrix of item intercorrelations to be one; i.e., that all items are measuring a single general factor and specific factors, and that no other general factors or group factors are present. Jackson (79) proposed a new measure of accuracy of measurement which he called the "sensitivity" of a test. This value is reported to be the ratio of the standard deviations of the true scores and the errors. It is difficult to see any advantage which this value has over the standard error of measurement. In a later discussion (78) of the relationship between the sampling unit and the estimates of reliability of a test the author employed the probable error of measurement.

The probable error of measurement is ordinarily estimated for an individual by indirect means. Kreezer and Bradway (92) reported a study in which they retested each person several times and calculated the probable error of measurement directly from the distribution of scores obtained for that individual. Certain factors such as gains due to actual growth were controlled to a considerable extent by using mature feeble-minded individuals. The factor of spurious correlation between specific factors due to the use of the same form on each retest was not discussed. Lorge and Morrison (106) reported that for a group of about one hundred individuals who were given two forms of five attitude scales two weeks apart, the principal component scores beyond the first factor were not reliably

determined. Other variations in retest scores were reported in Chapter VII. The reliability of the essay test was reported on earlier in the present chapter.

Validity and the Interpretation of Scores

It seems strange that the problem of validity, which is the prime essential in all testing, has not received more adequate treatment. Only a few scattered papers have discussed this topic even briefly in the past three years. A valuable starting point has been provided by Burton (20) in the form of an outline definition of validity. Ryans (138) discussed the use of the methods of factor analysis in validating tests. Carr (21) emphasized the dependence of validity on reliability, and suggested it might be more satisfactory to report the type of relation to which the coefficient applied rather than to try to classify it as a measure of reliability or validity.

Judgments and ratings play an important part in the procedures of validation but analyses of such judgments have been all too few. Preston (131) pointed out that in increasing the size of the group whose average judgment is used, the reliability of the judgment may be increased in the sense that it would agree more closely with another similarly obtained average judgment. However, this does not at all guarantee that the average judgment is becoming more valid, since it may merely be more accurately measuring something negatively correlated with the trait in question. Large numbers will not serve as a substitute for accurate analysis and penetrating insight into the behavior in question. A review of the recent literature concerning the neurotic questionnaire with special reference to its validity was made by Mosier (120). There has been a real need for easily understood procedures for describing test validity. Taylor and Russell (152) provided tables giving the proportion of persons who will be satisfactory when three conditions are known: (a) the proportion of satisfactory individuals among the candidates, (b) the proportion of candidates to be selected, and (c) the correlation of the selective battery of tests with the criterion.

Norms—Courtis (27) emphasized the need for a measure of the effort put forth on a test and the desirability of measuring results in terms of growth. Main and Horn (110) presented evidence that the use of grade norms which were not based on really average or unselected children of a given age, with specified amounts of school experience, caused the average child to appear "maladjusted." Kelley (85) provided a discussion of the difficulties in interpretation of the ordinary age and grade norms and proposed the use of norms describing the modal age group in a given grade. He termed these "ridge-route" norms since they follow the ridge of the frequency distribution. The system of Scaled Scores developed by Flanagan (52) for the Cooperative Tests similarly provides norms for specified age groups in a given grade who have had a particular amount of instruc-

tion. Other problems in the derivation of norms have been discussed by the same author (51). Kent (90) has provided a discussion of the value of local norms for an institution.

The problem of "practice effect" has not received much attention in the recent literature. McIntyre (109) reported that in standardizing intelligence tests in Australia a fairly large gain attributable to previous experience with the test was made even after a year. It seems likely that with the increased use of tests in this country, students will become so "test-wise" as to render the advantage gained from having taken a similar form of the test practically negligible.

Problems of Administering and Scoring Tests

A review of this field prior to 1938 was made by Frutchev (59). In the field of test administration, Dickenson (36) reported a plan for preventing copying by having students code their answers according to a simple pattern word which would differ for adjacent students. A problem has arisen because some scoring devices are such as to prevent the student from changing his answer if he feels his first choice was incorrect. Berrien (8) found that students in psychology classes improved their scores by making changes.

Three studies have been reported recently concerning the effect of the method of indicating responses to test items. Tireman and Woods (165) found that when the same test was retaken by students by underlining their answers, they were able to improve their scores over those made by indicating their answers in the margin six weeks earlier. It is difficult to determine how much of this result may be attributed to the method of responding and how much to practice effect and learning. Votaw and Danforth (173) administered a 50-item achievement test in three ways: (a) placing the number of the selected answer in a marginal space, (b) underlining the selected answer, and (c) placing a check mark in the appropriate square or space on a separate answer sheet. Students poor in a test involving following directions for putting numbers in squares did less well on (c) than they did with the other methods. It is not clear how much of this might be attributable to their not understanding the directions. The students took 18 percent longer for methods (a) and (c) than for method (b). In this comparison also it is difficult to estimate how much time was lost in getting the directions. The most extensive experiment in this field was made by Dunlap (41). Using three thousand students in Grades IV to VIII he compared articulated and nonarticulated answer sheets, repetitive and serial numbering, underlined score when the answer is also marked elsewhere and just marking elsewhere, and marking on the margin versus marking on a separate answer sheet. In general the differences between the various procedures were not large.

We may conclude from this and other accumulated evidence that practically all students can learn to mark their answers on margins or separate answer sheets if given an opportunity to practice, but that any new method of administration may cause some variations in scores. The person interpreting test-scores must usually keep in mind the disturbing possibility of serious scoring errors if the tests are being scored by untrained clerks or by teachers. Dunlap (43) reported many scoring errors when teachers scored two-choice items in which the answers were indicated in the margin. They also have difficulty when two words are to be underlined in the text. A short method of scoring the Bernreuter Personality Inventory was developed by Bennett (7). This was described in Chapter V.

In summary it is gratifying to note that the number of problems for which rational rather than empirical solutions are being obtained appears to be definitely increasing. The most encouraging trend is that technics are gradually being developed which are appropriate to the complicated situations with which the study of human behavior is concerned.

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INTRODUCTION

THIS NUMBER of the REVIEW OF EDUCATIONAL RESEARCH is the fourth to be devoted to finance and business administration; previous issues appeared in April 1932, April 1935, and April 1938. This number follows the same general plan as previous numbers, but there are changes in the title and contents of some of the chapters

This is the first number in which a chapter has been devoted to the administration of school transportation (Chapter IX). A separate chapter has been set aside for the legal aspects of finance and business administration (Chapter XII). Chapter VII, for the first time, attempts to cover fully the important field of school credit regulation including the management of school securities. In Chapter X an effort has been made to treat supply management more comprehensively than previously. Material relating to higher education has been included in various chapters instead of in a separate chapter. The chapter on salary scheduling, which has appeared in previous numbers of this series, is omitted from this number since it is now included in the issue of Teacher Personnel (June 1940). The literature cited, as in previous numbers, includes significant related researches by other than educational authorities, particularly when there appeared to be conflicts in the findings and conclusions.

EDGAR L. MORPHET, *Chairman*
Committee on Finance and Business Administration

CHAPTER I

Planning in Finance and Business Administration¹

WAYNE W. SOPER

PLANNING OF ANY KIND looks to the future. Financial planning embraces the fiscal aspects of education, but its ultimate objective is not simply financial economy, adequate support, and wise expenditure of funds; the objective is more particularly an educational program adapted to changing educational needs. Financial planning overlaps such areas as educational support, budgetary procedure, and costs.

Local Planning

The board of education is the chief agency for local planning, but it may be guided by the school executive and the community. Barnes (4) suggested that boards of education should serve as buffers between discordant community elements and at the same time should assume social leadership expected of educational trustees. Deffenbaugh (15) intimated that, since local boards are responsible for the raising and expending of the largest percent of school revenue, they should plan seriously the fiscal aspects of their duties. That the school executive sometimes usurps the board's function was implied by Mulford (33) when he stated that teacher-training institutions sometimes err in not impressing upon prospective school executives the purely administrative nature of their jobs. Boards of education should expect the administrator to preserve the continuity of planning and to report the trends that affect planning but should not rely upon him for formulation of plans—policy-making.

As an aid to planning for bonded indebtedness, Mulford (32, 31) suggested two worthwhile improvements: (a) a better scheme of amortization based on departmentalization, and (b) amendments to school laws which would permit accumulation of surpluses to be invested in government bonds, timed to fall due as new construction is required. Scates (43) outlined steps to be taken in getting votes for a bond issue or tax levy. He suggested (a) a sponsoring lay committee, (b) a planning committee to do the basic work, (c) a liaison-leadership link between planners and field workers, and (d) field workers—speakers, canvassers, writers, reporters, and contact groups. Schmidt (44) discussed the need for uniform accounting and control of student and school funds. He suggested that records of such funds be kept and reports made, and that the authority to expend be separated from the custody of moneys.

¹ Bibliography for this chapter begins on page 140

Statewide Planning

Two agencies contribute directly to statewide planning, the state board of education (or education department) and the state legislature. Other agencies—state teachers' associations, labor organizations, youth councils, adult forums—exert varying degrees of influence and pressure, but none of these possess any legislative or quasi-legislative functions. Mort (31) recognized the state's responsibility for setting up boundaries within which local units can function satisfactorily when he outlined a structure of school finance wherein the state does the planning of major issues and localities are left sufficient details to preserve local initiative and independence.

The need for more careful planning to avoid future difficulties, such as some of the states find themselves in today, was emphasized by several writers. Ade (1) stated that the present plight of the schools in Pennsylvania was not of sudden development but due to causes growing out of inadequate or ineffective legislation of long standing. Speaking of inequalities in public education in Kentucky, Bell (5) and Whittinghill (49) indicated that the remedy lay in a better-planned program of state support. Burke and members of the staff of the New York State Teachers Association (8, 35, 37) commented upon the findings of the Regents' Inquiry that New York State needs more education, not less. It was argued that the present reduction in state aid penalized the very districts that needed it most. A review of the activities of such tax-conscious groups as the Associated Industries of New York State, the American Petroleum Institute, the New York State Economic Council, and the Citizens Public Expenditure Survey, included a warning of their likely future attacks upon the cost of education because (a) federal taxes cannot be reduced, and (b) it is politically safer to attack the schools than any other large-spending agency at the present time.

Faulty tax systems were blamed by several of the authors already referred to and also by Chisholm (10), Hudson (24), Joyal (25), and Witham (50) for many of the fiscal difficulties of the schools. Some new taxes, designed to relieve the tax-oppressed, have removed a tax burden from one shoulder and placed a heavier one on the other shoulder. A recasting of the tax structure for school support is necessary in some states to equalize the taxes paid by different industries. In general, railroads are overtaxed while other profit-earning enterprises are undertaxed. Phillips (39) referred to large accumulations of delinquent taxes, reduced cash balances, increased short-term borrowing, and reduced valuations as problems being attacked by the Michigan State Teachers Association.

Indicative of far-reaching plans to ameliorate inequalities of educational opportunity are statements by Holmstedt (23), Dewey (17), and comments in *School and Society* (2). The answer to inequalities does not lie in a panacea applicable to all states, but in revisions, adaptations,

and adjustments of many elements peculiar to each individual state. Elimination of small districts and substitution therefor of larger administrative units has gained wide acceptance. Morgan (30) reported that the state retail sales tax of California represented a major source of revenue for the schools. According to a study by the New York State Teachers Association (36), New York State property taxpayers have received major benefits from state aid for education: (a) reduced property tax rates, (b) tax relief for confiscable property, (c) automatic school economies, and (d) avoidance of increases during the depression. Covert (12) and Bolling (6) reported that financing the educational program in West Virginia had been greatly improved by the new program of school organization and financing.

National Planning

Problems of educational finance should concern the statesman as well as the educator. Both must see to it that enough of the social income is invested in education "to maintain a level of culture sufficient to support democratic institutions" Several writers warned of the serious competition among governmental agencies for tax moneys. Larson (27), noting the trend to pensions for the aged, stated that much study and effective financial planning must be done before the states choose between schools for youth and pensions for the aged. Kirkendall (26) warned of the threat of relief expenditures to educational financing.

According to Coyle (13), Dawson (14), and Douglass (18), the only solution to pressing financial problems in many of the states, especially those states with low wealth per school child, is federal aid. Of necessity, adequate financial support of public education during the next decade must rest upon economic policies for the country as a whole (22). Dewey (16) outlined a plan of cooperation between the states and the federal government, reserving to each certain tax sources, and Strayer (45) urged a campaign in which all educators must participate to enlighten the public regarding the needs of our schools.

Forethought in Business Management

Arnold (3) revealed that the field of business management is not sufficiently reflected in educational research because (a) relatively few research workers are in close contact with this field, (b) some feel that the business management of education is a matter of lay concern, and (c) the problems of finance and business management are frequently foreign to schoolmen. Parmenter (38) and Bутtenheim (9) implied that business management services are essential to the conduct of an effective educational program. Reeder (40, 41) argued for an improvement in school business management and outlined research problems in this field. Engelhardt (20) pleaded for a trained, creative, dynamic, business

worker able to cope with the pressing complex problems of today. Lewis (28) and Rich (42) emphasized savings through good management. Further aspects of personnel and training are given in Chapter XI

Bolmeier (7) discussed municipal participation in the control of the city school property in those localities where the law vests the control of such property wholly or partly in city officials. McCuen (29) reported upon a survey of school property accounting in California and indicated that in general, lower standards prevailed than those recognized as essential by authorities in this field. In a series of articles dealing with the management of school property, Weltzin (46, 47, 48) discussed statutory provisions in certain states relative to title, transfer of title, sale of school property, and debt limitations on such property.

Permanent School Funds

Planning for the preservation, investment, and use of permanent school funds began in some states even before the perfection of a school organization. That some of this planning (or lack of planning) was faulty is well known. The process of correcting earlier mistakes and of making wiser provision for the future security of such funds still goes on. Ellhott (19) reviewed the status of permanent funds in Michigan; Covert (11) indicated that of the forty-eight states Minnesota has the largest permanent investment fund for the public schools, the income of which is used for three main purposes. A definite recommendation for a better employment of, as well as a safer investment for, the state permanent school fund comes from the biennial report of the Florida State Department of Public Instruction (21). This report recommended as a future policy the investment of the permanent fund in local school bonds, thus safeguarding the fund and at the same time providing a cheaper and more satisfactory source of capital funds for local districts.

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CHAPTER II

The Support of Education—Major Problems

LESLIE L. CHISHOLM

THE GRAVITY OF INADEQUATE financial support for schools has recently been indicated in the *Journal of the National Education Association* (22) and the *School Executive* (23) which pointed out that (a) school districts serving 3,000,000 children are forced to curtail their school year by three months, (b) 2,400 schoolhouses are actually locked for the year, (c) 12,000 more schoolhouses will be locked if teachers demand full payment of salaries, (d) 1,400,000 pupils sit in schoolhouses condemned, unsafe, or unsanitary, (e) 1,000,000 attend classes in tents, lodge halls, and stores, (f) 500,000 go to school only half a day because of lack of space, and (g) 800,000 attend no school because their neighborhood is too poor to provide one or they are too poor to go. Adequate support for the schools is not merely a problem of the poorer districts and states; it is a question of first magnitude also in the wealthiest states. Hammond (35) said that Arizona, Arkansas, Connecticut, Georgia, Illinois, Indiana, Iowa, Maine, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, and Tennessee "are the states in the gravest difficulties." Morneweck (55) included New York State. Large cities as well as towns, villages, and rural areas likewise face the problem of inadequate financial support for the schools. Harris (36) said that in many states, cities, and towns throughout the United States there is already in operation or is threatened, due to financial stringency, a radically shortened school year. Chisholm (13) stated that until we are able to secure a sufficient amount of money for the support of the schools, needed improvements in teaching, supervision, curriculum revision, guidance, and other areas are impossible.

Education and Economic Well-Being

Any fundamental approach to the solution of the problem of securing adequate financial support for the schools should be based on a knowledge of the relationship between the work of the school and the economic well-being of the people. In an Educational Policies Commission study (60) it was pointed out that adequate financial support of the schools is basically possible and defensible from the strictly economic point of view, as well as desirable from the social point of view.

¹ Bibliography for this chapter begins on page 152

The very existence of our enormously productive industrial economy would be impossible if the population of the United States were illiterate, ignorant, and occupationally unskilled . . . From the economic viewpoint, it is wise public policy to offer the kind and amount of education which will result in the largest total income after paying the cost of the education to individuals and to the nation . . . The point of diminishing returns in expanding educational opportunity has not been reached from the economic standpoint.

G. Strayer (83) said that no one would propose that we support the services of education out of relation to the economic well-being of the people. Hunter and others (38) pointed out that education throughout our 150 years of national existence has been a major factor in enabling our 130,000,000 people, or 6 percent of the world's population, to accumulate 54 percent of the goods and services of the world. Spaulding (81) said that the secondary school more than any other single institution has helped to minimize class distinctions and to keep class lines fluid, a significant factor in the economic well-being of a people. Chambers (10) said that lack of adequate educational opportunity for farm boys and girls will tend toward the reduction of the American farmer to peasantry, with his sons and daughters drifting cityward to become an exploited substratum.

General Tax Revision

Those attempting to solve the problem of securing adequate financial support for the schools in many states will encounter, early in the effort, the question of general tax revision and efficient tax administration. Chisholm (14) and Dewey (21) have emphasized (a) defects in tax structure, (b) equalizing the tax burden, and (c) flexibility. Such authorities as Green (32) and Shultz (78) have called attention to characteristics or criteria of a good tax system: economic adequacy, economic soundness, equity or justice, breadth of base, flexibility or elasticity, and economy or simplicity of administration. They also discussed the merits of given taxes. One of the most comprehensive recent treatments of the property tax is that by Woodworth and others (96). Wolfbein (95) studied property taxation through the trying period of the past decade. He concluded that the property tax remains the basic and most important source of revenue for municipalities. He raised the question whether, if the property tax has broken down, the state should increase the amounts of money it sends back to the cities. Ford and Wood (30) have studied the taxation of intangibles, indicating problems and methods.

Efforts at Tax Revision

The National Education Association at its 1938 summer meeting passed a resolution urging educational organizations to carry on an intensive program to enlighten the public on the question of general tax revision. The Michigan Education Association (68) has studied state tax adminis-

tration, the sales tax, corporation tax, inheritance tax, the personal income tax, and similar possibilities in taxation. Attention also has been given to uniform reporting by local taxing units and to uniform budgetary procedures. Recent efforts in Kentucky (53) deal with taxation as it pertains to the support of the schools, particularly local and county taxation. An interesting aspect of the study is the constructive help and leadership furnished by the school of education of the University of Kentucky. In New Jersey (28), educators recently have studied the tax problem as it exists in that state. Certain groups or organizations outside the field of education are doing commendable work aiming at general tax revision. The Princeton surveys of local and state finance are comprehensive and constructive.

Recent efforts in the state of New York, like those in many other states, are the outgrowths or the continuation of efforts reaching as far back as the Educational Finance Inquiry of 1923. Recent problems, however, have to a considerable extent given direction to efforts. The New York State Teachers Association in its journal has printed a series of articles, for example Simpson (79), on various phases of taxation, especially as they pertain to the adequate support of the schools, and has cooperated with other groups interested in tax revision. In Ohio, a Citizens' Committee on the Crisis in State School Finance (65) and educators of that state are concerned with the elimination of earmarked taxes and arrangements whereby all obligations of government shall be provided for on a comprehensive budgetary basis. In Oklahoma, educators (67) are particularly concerned with the operation of the homestead exemption law as it handicaps more adequate support for the schools, as well as with its bearings on the practice of counties in making reserves for delinquent taxes.

A committee of the Pennsylvania Education Association (66) prepared a comprehensive report on school costs in that state. Chapter 2 of that report discussed taxation laws prevailing at that time, pointed to needed tax revision, recommended a state tax commission, and presented estimates of several potential tax sources. The material was prepared from the point of view of tax education. In Utah (93), efforts are aimed at securing a more equitable distribution of the burden of taxation among those who should pay taxes, through the levying of personal and corporate income taxes, revaluation by the state tax commission of all property assessed by county assessors, and distribution of motor vehicle license revenue to cities and towns for street purposes. In Virginia (11), educators have sponsored a study of sources of new tax revenue for the state. A committee of the Washington Education Association (94) prepared a bulletin on taxation in that state. Chisholm (14) said that the aim is to lay a firm foundation through study and discussion for the revision of the state and local tax system, to the end that the services which a democratic people want their government to perform shall be supported according to principles inherent in a democracy. A feature of efforts in the state of Washington

is the part played by one of the state's institutions of higher learning in affording as a part of a summer session an educational finance workshop where educators, especially chairmen of local study groups, may have an opportunity to make a comprehensive study of the problems of taxation and educational finance (12). Recent efforts in West Virginia (72) have been in the direction, chiefly, of encouraging improvements in the administration of the property tax, particularly assessments.

Property Tax Administration

Problems of property tax administration are of concern especially to those interested in local school support. The National Association of Tax Administrators (58) has given attention to problems of property tax administration. The Illinois Tax Commission (39), in cooperation with the WPA, made a survey of local finance in that state. The report of the survey traces the development of taxing units in local government and presents a comparison between Illinois and other states. The question of assessment has received considerable attention during recent years. Martin (51) pointed out that "one of the most urgent municipal revenue problems" is real estate tax assessment and collection. He proposed equalization of assessments. The National Association of Assessing Officers (57) formulated a set of assessment principles for the guidance of assessing officials. Sparlin (80) proposed state supervision of local property assessments as the first step in the direction of better and more uniform assessments. Enslow (26) discussed the New York State plan for assessment where state supervision of assessment is carried on through a bureau of the state tax commission. The Connecticut State Tax Commission (16) prepared a bulletin on modern methods for assessing officials. The Illinois State Tax Commission (40) prepared an assessors' manual.

Tax Limitation, Exemptions, and Delinquency

Thiel (90) listed and discussed six types of general tax limitation. The National Tax Association (91), through one of its committees, unequivocally opposed property tax limitation as being "not in accord with sound tax theory and practice," and also opposed the total exemption of property. Martin (52) also analyzed tax limitation, which he viewed as a handicap to the more adequate support of essential government services. Buehler (9) presented a picture of the constitutional limitations on taxation. Leonard (46) said that tax limitation frequently is a technic of those who seek to reduce governmental costs generally without regard to the demand for governmental services.

Since the property tax is the only major tax which can be administered efficiently by the local school district or the local taxing unit, exemption and delinquency are problems of concern in local school support. A committee of the National Tax Association (91) expressed the "firm conviction

tion" that homestead exemption is unsound and that the movement should be "positively resisted in the interest of building sound and stable state tax systems." Schmidt (75) analyzed the general problems of homestead tax exemption and said that (a) such exemption in every case means that some will pay more and some less taxes than formerly, (b) it may result in considerable curtailment of governmental spending and hence force home owners and nonhome owners to give up the enjoyment of governmental services which they otherwise would have enjoyed. Groves (34) discussed the use of tax exemptions as a bait to attract new industries to a given state as well as to retain those already there. He concluded that although the migration of business does happen, newspaper comments on it frequently are exaggerated and that states and localities still are able to exercise considerable independence in taxing industry.

Bloomenthal (8) made a survey of tax exemptions of various types and concluded that "taxpayers should be aware of the fact that they are carrying an enormous extra tax burden in order to provide subsidies for the vast amount of real estate which pays no taxes." Allen (1) called attention to extensive tax delinquency in both urban and rural areas. He said that the delinquency problem could be remedied considerably by relieving some of the property tax burden. Bird (7) and Jackson (41) also studied the trend in tax delinquency. Herzog (37) summarized the methods used to collect delinquent real estate taxes as being of five general classes: (a) penalties and interest, (b) tax sales, (c) foreclosure of tax liens without prior tax sales, (d) civil suit by the public authority, and (e) the receivership action brought by the state or municipality. He concluded that a law should be enacted which will fairly and equally adjust the rights of the municipality, taxpayers, and the tax lien purchasers. Too much emphasis on any one of these factors may throw the law out of balance and render it unworkable.

Nonproperty Tax Revenue

Nonproperty taxation has become and will continue to be of direct interest to educators because it is from this group of taxes primarily that state aid for the schools is drawn. This is due to the fact that with minor exceptions these taxes cannot be administered efficiently by local taxing units but can be so administered by the state. Nichols and others (64) presented a comprehensive statement of the sales taxes. They followed the general plan of the Reference Shelf series and presented arguments for and against sales taxes. Lockhart (47) analyzed the sales tax from the point of view of interstate commerce, indicating its operation from the point of view of influencing trade between the states. Jacoby (42) presented a detailed summary of sales taxes as used in twenty-eight states and the District of Columbia, while the American Retail Federation (2) presented a digest of laws of the various states as they pertain to sales taxes.

Tax Magazine (88) made a compilation of state taxes on industry in fifteen states. Arant (3) presented a comprehensive survey of business taxation in the Southern states. He found that in most instances such business taxes are regressive, and by natural operation alone are adjusted to only the taxable capacity of marginal concerns. For this reason they yield little revenue. Rauh (70) discussed the provisions of the New York State tax on unincorporated business as being a tax of 4 percent on the net income of any trade or business. He said that the tax promises to remain a part of the state tax system and predicted that it is likely to be copied by other states.

P. J. Strayer (84), in analyzing the possibilities of the state personal income tax, presented information concerning the historical development of the tax, indicating renewed interest in this tax during the past decade. Strayer said that as yet the personal income tax has assumed a major role as a revenue producer in only a few states, although thirty-four states have a personal income tax. The Bureau of the Census (92) prepared a digest of state net income tax laws and the Federation of Tax Administrators (27) prepared a similar digest for tobacco taxes. Richardson (71) concluded that in the ideal tax structure license taxes will serve (a) to support property taxes to obtain tax equality, (b) as a special contribution incident to regulation, and (c) to pay costs that especially benefit individuals or groups.

Trends in Tax Legislation

In final analysis, the trends in taxation during recent years are a reflection of the expansion of governmental services and the nature of our economy, with the interplay of such factors as tax justice, adequacy, ease of administration, and vested interest. During recent years there has been an unprecedented expansion of public services. The trend generally is toward a broader tax base and an increase in the use of nonproperty taxes, especially at the state and federal levels. This development is closely related to the trend among the states and the federal government to levy taxes and share the receipts with lower governmental units. There is a definite trend in legislation toward the imposition of constitutional and statutory limitation on the property tax and toward an exemption of certain classes of property, particularly owner-occupied homesteads (homes). The National Education Association (59) analyzed tax legislation, from 1934 to 1938 inclusive, affecting state school revenue. It was pointed out that twenty-three states have passed one or more measures aimed at property tax relief. Manning (49, 50) presented a summary of approximately 350 state tax laws passed in 1938 and 1939. The summary seemed to indicate a major reorganization in tax administration offices, additional sales taxes, and relief to property owners. He also pointed out that in 1939 sixteen states provided for the taxation of federal employees and six states included

income from federal securities. One of the most comprehensive sources for continuous study of the trends in taxation is the series of volumes entitled *Tax Systems of the World* prepared by the Tax Research Foundation, the most recent of which is the eighth edition (87). These volumes list the parts of the tax systems in use and indicate each tax the revenue from which goes into the general fund of the treasury as well as the governmental services supported on the revenue collected from earmarked taxes. The *Cost of Government* series by the National Industrial Conference Board (61) gives the trend in governmental costs and tax collections.

Debt and Income

Hammond (35) pointed out that the last governmental figures placed the American school debt at over \$3,000,000,000 and that interest on this amount averaged 68 percent of total expenditures for education. In three states, interest payments represented more than 10 percent of the total expenditures for schools. Sutton (85) studied school indebtedness in Illinois and concluded that indebtedness in that state will be the most important school problem for the next thirty years. The U. S. Office of Education *Biennial Survey of Education* is the most complete source regularly available for information concerning the school debt. Dana's study (18) dealt with the general governmental debt, which has a direct and important bearing on the support of the schools. This is Part Two of a study, the first part of which was published in 1937. *Tax Magazine* (33) pointed out that since 1931 the total state and local debt has remained almost stationary.

Taxation and Local Control

During nearly a century and a half of our national life the local property tax carried virtually the complete load of school support. With the breakdown of the property tax during recent years under the demand for increased tax revenue for the support of expanded governmental services, a larger percent of the support of education and other local governmental services has been shifted from the locality to the state. This transition has brought to the fore the question of the local control of education, a question growing out of the theory of American democracy. Mort and Cornell (56) outlined studies for the interpretation of the problem of control. The chief purpose of this study was to analyze the effects and the adequacy of control at the state and local levels, from the long-time point of view. Bateman (6) in Utah concluded that the general principle of local initiative based on local control was confirmed, but that at no time was state aid used in Utah to encourage the diffusion of the county school district idea. Knott (45) found that the tax-leeway given local school districts during prosperous times is a factor in local adaptation of the educational program.

Federal, State, and Local Responsibility for School Support

The potential advantage gained through general tax revision may not be realized in practice unless there is a balanced distribution of the burden of support among the three levels of government—local, state, and federal—unless each level of government assumes financial responsibility commensurate to its relative tax-raising power. The general nature of the need is indicated here as an aspect of the problem of securing adequate support for the schools, while a consideration of procedures appears in Chapter III. Moehlman (54) said that the fundamental principle in the financing of public education is that education is the concern of all the people to safeguard democracy. Crowder (17) said that by leaving the responsibility for education to the states and the local districts, we have “turned democracy’s noble talk of equality of educational opportunity into a wry boast.” Sellers (77) commented on the need for the state to equalize educational opportunity among local districts up to the level of a minimum program for the state, and the need for the federal government to equalize educational opportunity among the states up to the level of the national minimum program. The Committee on State Aid of the Educational Conference Board for New York State (63) said that in order to provide more adequate educational opportunities and preserve home rule, state-collected taxes will have to be shared with school districts through a system of state aid.

Davisson (19) said that the question of state financial assistance to local governments is important and payments through shared taxes and grants-in-aid have increased rapidly during recent years. He expressed preference for grants-in-aid, which would involve (a) consideration of the financial problem of both guarantor and guarantor, and (b) a basis for distribution insuring a minimum standard without placing disproportionate tax burdens on those areas with few taxable resources. Stauffer (82) felt that state aid to local units should obtain (a) in instances where, and to the extent that, local governmental authorities do not possess adequate revenue-raising power, and (b) under circumstances in which for reasons of social control it is imperative that a given function be financially supported out of revenues raised through nonlocal sources. Swift (86) analyzed policies and methods of educational support in France, Czechoslovakia, Austria, Germany, England, and Wales.

Social Interpretation and Educational Finance

Considerable attention has been given during recent years to an adequate program of social interpretation or public relations in the field of educational finance. G. D. Strayer (83) indicated the significance of a program of social interpretation in the solution of the problem of adequate support for the schools when he said, “Nothing will more certainly deny adequate support than a lack of understanding.” Kefauver (43) said that the controlling public opinion controls education and that none of the existing

controls of education is permanent; all can be modified. Graham (31) said that the people will support education to the extent that they realize its importance to their welfare and have confidence in the schools. Deisenroth (20) pointed out the need for an understanding of the work of the school on the part of the laborer, small town store owner, and others as a basis for offsetting the adverse influence at times of "a few of the really big men of town." According to *Nation's Schools* (29) the teaching profession should carry on a continuous program of interpretation as a means for securing more adequate financial support. Saylor (73) pointed out that the taxpayer is going to evaluate, to demand substantiating evidence, to require value received for money spent, and to be content with an average program unless he can be shown the need for a progressive, well-rounded educational program in the schools. Sears (76) said the interpretation program should come to grips with the real problems of education as a means of soliciting the full cooperation of teachers in a clearly conceived plan for the solution of the problems. A section of a national seminar on the protection of school funds (31) dealt with informing the public about the schools.

Procedures in interpretation—Englehardt (25) said that the school and other essential governmental services can be financed adequately if educators and social workers, civic planners and schoolboard members, lay leaders and economic experts, business realists and humanitarian idealists join in local conference to make possible the integration of programs and to develop comprehensive long-range plans covering all outstanding group and individual needs. On the basis of experience in campaigns covering three bond issues, one building levy, and four special operating levies, Scates (74) stressed the need for an adequately planned program of interpretation, called attention to the need for variations in programs for different communities, and discussed various parts of a larger type of financial campaign. A report in the *Elementary School Journal* (69) gave the results of a survey of public attitude toward the support of the schools in Michigan. The same general technic was used as that in the Gallup polls. The results obtained indicate that 68 percent of those surveyed did not favor the \$5,000,000 or 11 percent cut in state aid for the schools made recently by the state legislature. The survey also studied the reaction of groups and found that "Republicans and Democrats, Protestants and Catholics, rich and poor, farmers and urbanites—all agreed that public education should be guaranteed more adequate financial support." Any truly worthwhile or significant program of social interpretation must take hold on the humble plane on which the people's thinking rests at any given time.

Retrenchment

There are some who propose a negative approach to the problem of inadequate financial support for the schools in place of seeking general tax revision, an equitable distribution of the burden of support among

the three levels of government, a defensible plan for the distribution of funds to the local school district, and efficient employment of revenue. Many proposals for retrenchment have come from taxpayers' associations and economy leagues, which the *American School Board Journal* (89) said have grown up "like mushrooms and have continued to grow in number and in intensity of activity." It said that while in many instances the citizens identified with tax pressure groups manifest a cooperative attitude toward school interests in suggesting revisions in the local educational program, they nevertheless in all instances demand drastic cuts in school costs. Leonard (46) said that those who proposed drastic reductions in taxes gave only minor consideration to the demand for governmental services by the people. He challenged the logic of the inference that a taxpayers' group represented the thinking of all taxpayers. Asplund (5) proposed a constructive approach to economy in governmental expenditure through such controls as budgetary procedure, uniform accounting, reports, annual audits, and statutory provisions whereby governmental expenditures may not exceed income. A ten-point set of criteria for judging the merits of reports is given. Hammond (35) said that since many states spend less than \$30 per pupil for current expenses of the schools, a proposal for retrenchment in school costs is like telling a man with a family of ten to feed on \$10 a week that he simply cannot spend so much on food. It was the study by the Educational Policies Commission (60) especially that left proposals for retrenchment little ground on which to stand:

Economic theory proposes that enough education should be provided so that persons can work in the manner and in the occupations where the aggregate of their incomes will total the largest amount over and above the cost of education involved. If any less education is provided, the income of society will be correspondingly reduced. . . . One role of education in a democracy is to remove factors, other than those named above [differences in capacity and diligence], which result in differences in income. We know that the amount of education thus far provided in the United States is insufficient to fulfill this role.

It stated that from the economic point of view a state or nation can well afford to spend funds for education up to the point where the economic dividends realized by society from the schooling are not exceeded by the cost of education.

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CHAPTER III

Federal, State, and Local Support of Education¹

LESLIE L. CHISHOLM

DURING THE PAST three years there has been increased emphasis on a more equitable distribution of the burden of school support among the three levels of government—federal, state, and local. Perhaps in no other equal period has there appeared so much research and discussion pertaining to the responsibilities of the federal government.

History of Federal Support

Blauch (7) traced the history of federal aid for education, beginning with the first grants of land before the adoption of the Constitution. Dawson (33) presented a brief history of federal aid, emphasizing efforts to secure federal aid for education since the World War. Judd (55) pointed out major steps in the history of federal aid for education. He said that the time has come when emergency measures should be replaced by a clearly perceived policy. Pulliam (82) traced the history of federal aid from 1785 to the present, discussing federal legislation and mentioning the amount of aid. He pointed to specific illustrations of grants without control and grants with definite controls and described recent federal educational projects uncoordinated with the work of the regular school system. Russell (86) presented a brief history of federal aid for education.

Establishing the Principle of Federal Support

The Advisory Committee on Education (1) established several significant points on the basis of a vast amount of supporting data: (a) that the states vary widely in basic ability to support education and in the educational load to be carried, the poorer states having many more children in proportion to the number of adults, (b) that education in large sections of the country is in a deplorable condition due to the lack of adequate financial support, and that this condition generally is not due to the lack of effort on the part of the people to support schools in those areas, and (c) that federal aid for education is sound in principle and essential if all American children are to have adequate educational opportunity. The Advisory Committee's report and its accompanying nineteen staff studies have stimulated much thinking and discussion. The report has been commented on by Butterfield (13), Chambers (14), Dawson (33), Edmonson (39), Givens (46), Hall (50), Lane (58), Norton (78), Strayer (91, 92), and a number of magazine editors. Ganders (45) presented a

¹ Bibliography for this chapter begins on page 167

comparative summary of the reports of the two advisory committees of 1931 and of 1938 Dawson and Carr (36) summarized the report and the nineteen staff studies.

Nine well-known educators and laymen (81) recently made statements on federal aid for education. Strayer (92) pointed out that federal aid for education is based on the need of the several states, the fact that the nation is rapidly becoming a single economic unit, and the mobility of the population. Chisholm (22) compared the fight for federal aid for education to that for public school support of a century or more ago and said that the present effort is merely another phase of the battle for adequate educational opportunity for all children in this country. Pulliam (82) said that it is only through the use of the superior taxing power of the federal government that we can provide equal educational opportunities throughout the nation and hence have a truly democratic school system in our industrial society.

Swift (96) said that public education in the United States has never been universal, democratic, or universally free, and that the crisis in school support during recent years has been merely a sharp upward turn in a pathological situation that has existed throughout our national history. Chisholm (23) made a study of the experiences of the rich and the poor states in financing their schools during depression years. He found that if the states were ranked according to basic ability to support their schools, the richest states were able to withstand four years of the depression better than the poorest states were able to withstand two years of it. Judd (55) criticized federal aid for the schools during the recent years as being nothing more or less than "a belated effort to meet by purely temporary measures a situation which has been coming upon this country for years and is now threatening to mature into a wide-spread catastrophe." Norton (78) presented a summary and interpretation of the evidence which national committees and research workers have assembled during more than twenty years of investigation. Chisholm (17) analyzed factors contributing to the need for federal aid for education. Dawson (33), Edwards (40: 121-36), the National Resources Committee (75), Givens (46), and Hall (50) discussed the significance of mobility of population for federal aid for education. Chisholm (18) treated federal aid for schools from the point of view of a wealthy populous state, devoid of sectionalism and committed to the American way of life. Dawson (34) regarded federal aid for education as a part of the new federal program of conservation of the natural resources.

A knowledge of the educational activities engaged in by the federal government is important in establishing the principle of federal support for education. Considerable interest has been demonstrated in this aspect of the problem. The Advisory Committee (1) and the Educational Policies Commission (73) have presented a comprehensive picture of those activities

Three Major Studies concerning Federal Aid

Norton and Norton (79) brought to focus information bearing on three paramount questions concerning the problem of federal aid for education: (a) is our economy adequate to support a modern program of education, (b) what is the financial condition of the schools in the various states—including such items as ability of the states, effort, adequacy of the schooling being provided, and (c) what meaning does all this have to social policy? On the basis of this study the authors concluded that the nation did possess the economic ability to support an adequate program of education but that this condition will not result in adequate support for the schools unless there is some pooling of the nation's economic resources for school support.

Chisholm (24) concluded that the fiscal policy of the federal government has added to the gravity of the problem of financial support for schools. He made a study of who actually paid the federal taxes eventually; i.e., the extent to which each federal tax finally came to rest upon the economic resources of each state as a result of tax shifting by those who initially paid the tax. He found that the states least able to support their schools under a system of state and local taxation based on the Model Tax Plan, the states which by existing tax plans were least able to raise revenue for support of their schools, which kept their schools open the least number of days and furnished their children the poorest building facilities, were generally the states which, since 1928 and 1929, the federal government has called upon to contribute an increasing amount and an increasing percent of the total federal tax collections. The federal tax load on some of the poor states has doubled during the past decade while it increased less than 50 percent for the country as a whole.

In his study of the responsibility of the federal government for the support of the schools, Edwards (40) pointed out wide variations in the basic ability of the states to support their schools and significant variations in the educational load to be carried in the several states, due primarily to differentials in the birth-rate. He said that unless the federal government assumes its responsibility for the support of the schools, education may become an instrument of social stratification and of regional and racial inequality instead of a force to equalize opportunity. Edwards put the gravity of this problem on the front doorsteps of every state when he pointed out the extent of interstate migration. Particularly is the migration of youth from the underprivileged educational sections of the country to the wealthy industrial states and larger cities very great. These youth bring with them the handicaps of an inferior education.

Some have argued that federal aid for schools during recent years is being taken care of through federal relief expenditures and other forms of federal subsidies to the states. This trend of thinking would serve the purpose of a grand finesse in the case for federal aid for education. Chisholm (19, 24) made a study of this question and concluded that what

the schools need most from the federal government is direct federal aid allocated to the states according to the most defensible plan that can be devised.

How Much Federal Control?

The question of whether federal control should go with federal aid for education has been one of concern to those interested in the relationship of the federal government to education. The Advisory Committee (1) stated four reasons for state and local control of education: (a) it makes possible local experimentation, (b) facilitates the adaptation of the schools to the needs of the people in greatly varying areas, (c) denies to any group or party temporarily in control in the central government the opportunity to regiment through propaganda the thinking of the American people, and (d) encourages the acceptance of responsibility by all the people for the maintenance of public education. The committee, however, after accepting the general principle of state and local control, did approve some federal control. A discussion of federal control formed a part of the 1939 program of the American Educational Research Association. Reeder (84), for example, presented arguments for a given amount of federal control, but definitely limited the nature and the extent of federal control which he favored. He would safeguard state and local initiative and control over the curriculum but would have the federal government make certain that federal aid for education was spent honestly and efficiently. Dawson (35) argued against federal control as being unnecessary since the conditions which such control seeks to remedy prevail chiefly because (a) there is a lack of adequate funds, (b) it is based on false assumptions, and (c) it is difficult or impossible at times to administer. He stated that the equalization of educational opportunity is the one big aim, not the paternalistic domination from a "supposedly superior federal intelligentsia." He outlined ways he believed the use of federal funds could be safeguarded without federal control.

Fowlkes and Edmonson (44) debated the question of federal control. Fowlkes favored federal control of education and proposed that federal aid for the schools be given through a series of grants for specific parts of the educational program. Edmonson opposed federal control and proposed that federal aid be given for the general support of the schools. Butterfield (13) favored some control. Swift (94) criticized the policy of a system of national grants entirely free from national direction and supervision, and said that he found no place in the history of state aid in England and Wales for that policy. Edwards and Richey (41) found that state-administered funds did not appear to be equitably distributed among rich and poor, urban and rural areas. They said that if the federal government should adopt the policy of granting aid to the states to equalize educational opportunity some precaution should be taken to insure an equitable distribution of the funds within the states. In his review

of the history of federal aid for education, Russell (86) concluded that support and control are not likely to be separated very far. A statement by Campbell in the *American Teacher* (81-58) warned that the alternative to federal aid and control may be an increasing proportion of separate federal agencies such as those which have operated since the beginning of the depression.

Strayer (92) claimed that federal control over special grants such as those for the construction of buildings is undesirable and likely to lead to further control. A volume by the Educational Policies Commission (74) recommended that the control in existing programs of federal aid for the schools should be repealed. It was pointed out that national control of education is used by the totalitarian state to regiment the thinking of the people, while a decentralized school system is a most effective means of guaranteeing freedom of speech and of discussion as well as of protecting the schools against the propaganda of political groups in control of the central government at any given time. Kefauver (56) said that any control which the federal government exercises over education should be through professional leadership, well-supported experimental centers in different sections of the country, large research projects, and service activities. Edmonson (39) said that the question of federal aid should first be faced frankly by educators and not forced upon the schools through federal legislation.

Hall (50) asserted that the surest safeguard against federal control is an efficient, adequately staffed and equipped state department of education. Chambers (14) proposed that federal aid should be allocated to the states on the basis of an index of financial ability and educational load. Mort (67) and Charters (15) each proposed that federal aid should be allocated to the states on the basis of a formula. Pulliam (82) favored the general principle that all federal educational subventions should be placed under state administration and professional direction, but said that the federal government has a right to require a minimum amount of effort and the sound expenditure and proper accounting of federal funds. McNutt (60) said he believed that federal aid for equalizing educational opportunity among the states could be accomplished without federal control of the scope and content of education.

The Ability, Effort, and Need of States

There have been no studies devoted to the development of measures of ability or measures of effort of the states to support their schools comparable to those reported in the previous cycle of the REVIEW. However, Norton and Norton (79) have a chapter in their study devoted to a new combination of items which indicates the economic strength of a state. They also presented information concerning the ability of the states to support education based on the application of this formula as well as according to other measures. Edwards (40) presented information concerning

the ability of states to support their schools. Dawson (34) employed expenditures per person for retail sales as an indication of the economic ability of the states and found a wide range. Chisholm (17) called attention to the relative ability of the states to support their schools under the Model Tax Plan and stated that this relative ability remains surprisingly constant over a period of years. Newcomer made estimates for the Advisory Committee (1) of the relative ability of the states to support their schools. These were based largely on the approach she used in an earlier study.

Edwards and Richey (41) used a combination of measures of economic well-being to arrive at their estimate of need for the equalization of educational opportunity. These measures were (a) assessed valuation per child seven to thirteen, (b) an index of the plane of living, and (c) the number of children seven to thirteen years of age per 1,000 adults twenty to sixty-four years of age. Mort and Lawler (68) discussed four measures of educational need: (a) the weighted census unit, (b) the actual number of children of school age, (c) the number of pupils in average daily attendance, and (d) the number of weighted elementary pupil units. Norton and Norton (79) discussed three measures of educational need: (a) average daily attendance, (b) the number of children aged five to seventeen, and (c) units of educational need. Dawson (34), Givens (46), and Norton and Norton (79) concluded that the poorer states generally put forth more effort to support their schools in terms of their ability than do the wealthier states, yet the best they can do is to offer their children meager educational opportunities.

Federal Support for School Buildings

Depression conditions have made it difficult or impossible for many states and districts to meet school building needs. It also is generally felt that the problem of school building construction has stood in the way of desirable school district reorganization. Federal support for capital outlay is therefore important.

Moehlman (63) has called attention to possible plans of support for school building programs ranging from total support by the federal government to total support by the local district. The Advisory Committee (1) recommended a special grant of federal funds for the construction of school buildings to facilitate school district reorganization. Allen (2), Barrows (4), and Niles (77) each gave a comprehensive picture of the scope of federal aid for school building programs through the WPA and the PWA during recent years, as well as the extent of the school building problem still facing the schools. Allen said more than one-third of the nation's children now are attending school in buildings made available through this help.

Rice (85) pointed out the good which has come from federal aid for school building programs during recent years, but criticized the methods

of distributing such funds to the states as being on the "handout" basis instead of according to an acceptable plan of reimbursement or equalization. The net result, he said, has been that some states have benefited very greatly from such federal grants while others have not. Strayer (92) criticized the Advisory Committee's recommendation of a special grant for school buildings, because it might cause more state money to be devoted to school building construction than the state budget should permit in terms of the total educational needs. Long (59) proposed a large advisory service in the U. S. Office of Education to cooperate with the states in organizing and conducting surveys and in meeting other similar school building needs. Swift (95) reviewed the system of national aid for capital expenditures in England and Wales from the time of the first such national aid in 1833 to the present time, indicating changes in policy.

Federal Support for Vocational Education

Federal support for vocational education has been of two major types. The first is continued assistance for certain vocational work in the secondary schools. The second is through federal projects separate from the work of the regular school system. Russell and his associates (87) prepared for the Advisory Committee on Education a comprehensive study of vocational education. They gave considerable attention to its place in modern society and the responsibilities of the federal government toward it. The Educational Policies Commission (73) devoted a chapter to occupational training, placement, and rehabilitation, as participated in by the federal government. Blauch (8) prepared the Advisory Committee's staff study on vocational rehabilitation of the physically disabled. Strayer (91) said there was good reason back of the Advisory Committee's recommendation that special federal grants for vocational education be continued and that all special federal aid for vocational education of less than senior college grade be consolidated into one fund. Covert (25) reported on the amount of federal aid being given. Reed (83) questioned the President's recent request to Congress for an additional \$40,000,000 appropriation for the National Youth Administration for the construction and equipment of additional resident work centers in areas adjacent to defense industries. Reed pointed out that this dual type of vocational training program would interfere with the efficiency of the vocational work of the public schools.

Federal Aid for Parochial Schools

The recommendation of the Advisory Committee (1) permitting states to allocate a limited amount of federal funds to nonpublic schools, to be used for such services as transportation of students, textbooks, and scholarships for some students, has precipitated a considerable amount of discussion concerning the use of public funds for the support of nonpublic education. Hagan (49) challenged public support for public schools only,

and said that the separation of church and state so far as the support of the schools is concerned came as a result of the efforts of misguided zealots of a century or more ago. Ryan (38) said that the provision in the Smith-Hughes Act forbidding the use of federal funds for the support of private and parochial school services represents the "perennial bogey" of the separation of church and state which has been the excuse for intolerance to children attending religious schools. Donohue (38) proposed that the principle of democratic local control of education should be interpreted so as to permit local school districts overwhelmingly in favor of the parochial school to maintain those schools with public funds under a cooperative arrangement with public school officials instead of having to maintain non-sectarian public schools.

Strayer (92) opposed the use of public funds for the support of church-controlled schools because of the doctrine of separation of church and state, and the belief in the establishment and maintenance of a universal system of public education. Butterfield (13), Dawson (35), Norton (78), Pulliam (82), and Reeder (84) also oppose the use of public funds for the support of nonpublic schools. Burke (12) and the National Education Association (71) presented comprehensive analyses of the question of public support for nonpublic schools.

Federal Support for Negro Education

The feeling that Negro education is not adequately financed seems to be unanimous. The question seems to lie in what constitutes an appropriate method for remedying the condition. A yearbook number of the *Journal of Negro Education*, July 1938, presented a comprehensive picture of the nature and extent of the benefit which Negro education has received and is continuing to receive from the federal government. Wilkerson (98) prepared a staff study, devoted to special problems of Negro education, for the Advisory Committee. The Advisory Committee (1) recommended that the federal government in allocating funds to those states which maintain separate schools for Negroes should condition those grants upon the formulation of joint plans that will provide for an equitable distribution of the federal money between white and Negro schools, without reduction of the proportion of state and local funds spent for Negro education. Lane (58), while approving the general principle of state and local control over education, said that under the dual system of education existing in certain states the only guarantee of equitable division of federal funds is a specific stipulation to that effect in the authorizing federal act. Houston (54) opposed unlimited federal control of education but thought that federal control should be exercised to the extent of leveling off inequalities in education afforded white and Negro children. Norton (78) questioned the recommendation of the Advisory Committee on the grounds that, regardless of the desirability of the objective, it would mean the use of a "highly questionable general principle, namely, the determination of state educational policy

by the Federal Government." Dawson (35) said that the failure to provide adequate schooling for Negroes in states maintaining a dual school system was due primarily to the lack of money for the support of the schools generally and that the condition therefore would be corrected with adequate federal aid for education.

State Support for Education: Conditions and Trends

During recent years both rich and poor states have been either prevented from or greatly handicapped in their attempts to afford children adequate schooling. The solution to these problems has been a topic of considerable concern. Grace and Moe (47) made a comprehensive study of state school finance problems in the state of New York as a part of the Regents' Inquiry. Their study dealt with methods of apportioning state aid, the relationship of school district organization to equalization, the effects of state aid grants on public education, the trend in current expense, and unit costs in given public school systems of the state. Dewey (37) and Witham (99) each found a decided trend during recent years in the direction of the state assuming an increased part of the cost of the schools. Burke (11) analyzed state aid fundamentals. Strayer, Jr. (93) studied the evolution of state aid principles in New York State.

Edwards and Richey (41), although they found a definite and unmistakable trend toward equalization, also found that state aid in a majority of the twenty-six states they studied is not so distributed as adequately to equalize educational opportunities, the rural and the poorer counties receiving a smaller proportion of the state funds than is socially desirable. The county was the geographic unit within the state used as the basis of their study. Witham (99) used a formula for determining the degree of equalization of educational opportunity somewhat different from the indexes used by Edwards and Richey, but the findings of the two studies, so far as the use of state funds for equalization purposes is concerned, are quite similar. Holmstedt (53) analyzed the problems of state control of education, giving attention to such factors as the bases of state control of school finance, the nature and purpose of such control, and the allocation of control in school finance. Chisholm (20) showed that the fiscal policy of the federal government has a definite bearing upon the problem of state school support.

State Support for Education: Methods and Plans

The National Education Association (70) revised its one-page-per-state summaries of state school finance systems for a number of states and included information for one of the two states not included previously. Each statement shows principal sources of revenue and outlines the method followed in apportioning state school funds to local school districts. Covert and Keesecker (32) gave attention to the essential factors of legislation for

public school support, examples of various state support plans, and a hypothetical state plan for financing education. Covert (26, 27, 28, 29, 30, 31) discussed the methods used to finance the schools in Florida, Minnesota, Rhode Island, Texas, Washington, and West Virginia. Baldwin (3) also discussed the West Virginia plan. C. B. Moore (65) analyzed the adequacy of the state aid plan in the state of New York. Mort (66) discussed the effects of mandatory state legislation. Knott (57) criticized state school finance plans for failure generally to encourage local initiative adequately through tax-leeway. Chisholm (21) discussed approaches used in the state of Washington to work out plans for meeting crucial problems of school support. Bittermann (6) discussed the problem of state grants-in-aid.

State Support for Building Programs

Moehlman (63) pointed out that school building needs, particularly if desirable school district reorganization is to be effected, are the greatest in rural areas. These areas he pointed out are the ones least able to finance their schools generally and are heavily burdened with bonded indebtedness. He said that the state would need to assume its share of the responsibility along with that of other governmental levels if the problem is to be solved. Barrows (5) presented information on the school building situation in cities of 10,000 or more population and in seven states. The total shortage was estimated at more than \$2,000,000,000. Herlihy (52) presented information concerning expenditures for school plant operation in cities of 100,000 population or more for the years 1930, 1934, and 1936.

Local Support of Education

Since state aid given the schools in virtually all states is now substantial in amount, the problems of local support for the schools are closely related to problems of state support and cannot be understood except in that setting. Knott (57) studied the influence of tax-leeway on local initiative or adaptability. He found that during prosperous times tax-leeway was closely associated with educational adaptability, but during the period of economic depression high tax-leeway communities increased adaptations and reduced the tax-leeway while low tax-leeway communities either did not or could not resist the reduction of educational opportunities. Bolmeier (9) studied municipal participation in educational affairs in cities with a population of 50,000 or more, particularly in determining the school budget, the custody of school funds, auditing of school accounts, levy and collection of city school taxes, and the issuance of school bonds. C. C. Moore (64) told how pressure groups during the early years of the depression of the 1930's "nearly wrecked" local school finance in a certain city and how the solution to the problem was worked out. Overn and Knapp (80) developed an index consisting of three items for the measurement of effort of local school districts.

Taxation and School Support

The National Education Association (69) called attention to the shift from excessive tax burden on real estate to other tax sources and the collection of an ever-increasing proportion of the revenues by state governments, with a corresponding decline in the relative importance of local units as taxing agencies. Both Simpson (90) and the National Education Association (72) presented information concerning the sources of taxation used for the support of the schools. Simpson's material deals directly with the tax system of the state of New York, although he makes some reference to problems in other states. Buehler (10), Enslow (42), Newcomer (76), and Shultz (89) prepared a series of articles dealing with the business tax, the real property tax, the income tax, and consumer taxation. This series of discussions deserves the attention of anyone interested in the problem of taxation and educational support.

Tax Collections and the Protection of Funds

Givens (46) proposed that due to the nature of the modern corporation with its holding companies and interlocking directorates, its devices for avoiding taxation, and its undue influence in state legislatures which makes adequate state taxation more and more difficult, the federal government should become the chief tax collecting agency for the states. Manning (61) in a summary of state tax legislation in 1939 said that more laws were passed with respect to collection of property taxes than on any other phase of state taxation. The Michigan Tax Study Commission (62) pointed out that a major need in tax collection is the modernization of the collection system. The collection agencies in fifteen of the larger cities throughout the nation were described and principal sources of revenue given. Some attention in the report was given to the custody of funds. Chatters (16) emphasized the procedural aspects of property tax delinquency as a means for improving tax collections. He mentioned such items as the billing and follow-up, publicity, tax collection campaigns, including notices and meetings, and legal enforcement. The U. S. Bureau of Agricultural Economics (97) prepared a bulletin on tax collection procedures. As a part of the 1940 summer session of the National Education Association, Graham (48) conducted a seminar on the protection of school funds. The work falls into three major classifications: informing the public about the schools, protecting existing school revenues, and extending state support and federal aid.

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CHAPTER IV

Budgeting in Public Schools¹

EUGENE S. LAWLER and CHRIS A. DE YOUNG
with the assistance of HARLAN L. HAGMAN

Recent Budgetary History and Current Trends

WHEN TWENTE (45) made his pioneer study of budgetary procedures in local school systems in 1922 he wrote: "In the nearly one hundred references listed in the card catalog of New York City Public Library dealing with some phase of the budget in the national, state, or municipal government as administered in the United States, the school budget is not mentioned." Public school budgeting was in its infancy at that time as revealed by Twente's investigation of budgetary practices defined by school codes, reported by superintendents of schools in an inquiry of national scope, and revealed by a personal investigation of practices in a limited number of cities. Ten years later, in 1932, De Young's interviews (14) in twenty cities in five states and his questionnaires from an additional 801 cities from every state in the Union, indicated that budgeting in the public schools was in the kindergarten or elementary stage of development.

Important trends in the area of budgetary procedures seem to be (a) increased adoption of sound budgetary practices in all parts of the country, reflecting greater insistence of state and federal governments upon sound school district business control; (b) increased standardization of budget practices, particularly in states (as California) which make mandatory the employment of the U. S. Office of Education budget classifications; (c) increased use of publicity in the form of charts, graphs, brochures for the enlightenment of the school patronage; (d) increased emphasis upon the educational program as the basis for budget-making. Other developments include greater emphasis on long-term budget planning, a tendency toward simplification, increased agreement on local school district budget powers, and more cooperation in budget preparation. The concept of a budget stated by De Young (13) seems to be widely accepted in practice, namely: "The ideal school budget contains three parts: (a) the *work* plan, which is a definite statement of educational policies and program; (b) the *spending* plan, which is a translation of the accepted policies into proposed expenditures; and (c) the *financing* plan, which proposes means for meeting the cost of the educational needs."

Completed and Needed Research

Martin (27) set up twenty guiding principles for budget-making; Grace and Moe (19) reported on budgeting in New York State as a part of the

¹ Bibliography for this chapter begins on page 175

Regents' Inquiry; Mellon (28) investigated budgetary practices in the public schools of Illinois; Brokau (6), Cunningham (11), De Forest (12), Forrest (17), Marble (26), Merideth (29), B. H. Peterson (37), Sala (40), and Sundelson (43) investigated school budget practices in many states and reported them in graduate studies. Grose (20) studied 382 budgets in forty-six states, analyzed budget literature for the past twenty-five years, and drew up a set of principles for budget-making which he submitted to forty judges. Research which is needed at the present time includes a re-survey of practices similar to that of Twente (45) in 1922 and of De Young (14) in 1932. Campbell's investigation (9) of state supervision and regulations of budgetary procedure in public school systems made in 1933 should also be brought up to date. Numerous other financial problems related to public school budgeting, as listed by the National Survey of School Finance (33), await the zeal and painstaking skill of investigators.

Responsibility for Budget Preparation

Most authorities hold that proper budgetary practice calls for responsibility on the part of the superintendent for active supervision of the collection of data, the preparation of a tentative budget, its presentation to the board, and the administration of the approved budget (4, 18, 22, 31, 39). Several writers (16, 20, 39) emphasized the desirability of cooperative preparation of the annual budget, because (a) it is in keeping with democratic procedures, (b) it utilizes the complete resources of the school system, (c) it gives equal attention to all needs of the school system, and (d) it is based upon the educational program.

General opinion appears to favor budget preparation, adoption, and administration by school districts rather than by other governmental units (19, 31). Where the state government holds power of approval of school budgets, experience seems to indicate that educational needs would be better served if adoption power were vested in the local school administration. In cities where the municipal authority includes school administration, it is thought desirable that the functions of budget-making and disbursement be administered by the school system's administrative board. Mayor La Guardia (7) of New York City urged freedom for the city's board of education to allocate expenditures as it deemed fit. The Educational Policies Commission recommended budgetary independence (32), stating: "If the board of education is to accept responsibility for the development of the local school system, then it must have the determination and the control of its own budget." It also stated that the accounting which lies back of the school budget has little in common with general municipal accounting.

A recent Florida law (15) recognized the responsibility of the state department of education for supervising the preparation and administration of school budgets but prescribed definite limits to the authority of the state department so as to assure freedom for initiative by the local

administrative units. Changes can be required in the local school budgets when certain objective provisions are not complied with. In all other respects only recommendations can be made, and the local unit either accepts those recommendations or writes in its minutes the reasons for rejecting them and proceeds with the preparation of the budget. Severe penalties are prescribed for violating the provisions of the budget laws.

Standardization

During the past two years, school systems in California by state requirement have adopted the budgetary classifications recommended by the U. S. Office of Education (22, 31). In other states and in cities such as Gary, Indiana (4), the same classifications have been in use. The increasing tendency of states to require better school accounting practices before allocating state distributive funds has generally improved budget procedures. The rural school districts appear to lag behind the city systems in this respect (10). State assistance in financing local school transportation has been a marked factor in the past few years in improving rural school business practices in general (44). After a survey of budgetary practices in New York State, Grace and Moe (19) recommended that: "The State Education Department should prescribe minimum standards for school system budget-making and should promote long-term budgeting." The American Association of School Administrators (1) emphasized budgeting in the small school and presented a specimen budget for a school system of two hundred pupils.

Other Aspects of Budget Preparation

Simplification versus detail—The choice between detailed budgets and the simplification of school accounting in the interest of economy and clarity has not been settled. Blanch and Powers (5), after a study of budgetary practices in Washington, D. C., reported: "Budgetary procedure in the District of Columbia is needlessly complicated and expensive. Although it is necessary for the public to check officials in charge of the expenditure of public funds, there are now better methods than excessive detailing of almost innumerable items."

Basis for estimates—Holland (21) found a high degree of inaccuracy in estimating budgetary items of income and expenditure. Others (24, 29, 33, 39, 42) recognized the inaccuracy of estimates and proposed various means of reducing the inaccuracies. James (24) held that long-term budgeting provided a base for estimates. McNeely (25) held that the preparation of statements of unit costs was valuable in preparing the budget. The most common recommendation appears to be that estimates be based upon previous years' expenditures. Ford (16) held that cooperative preparing of budget estimates had to be followed by the superintendent's separate consideration of each request and the acceptance, rejection, or modification

of it. Most authorities appeared to desire evaluation of the budget on the basis of the educational program (13, 20, 27, 39, 42).

Publicity—Howell (22) described the Los Angeles plan for publicizing the budget by use of attractive brochures, charts, graphs, and other means. Bell (4) described the Gary, Indiana, plan. Many school systems provided attractively printed annual reports for their patrons. Some of these reports included an explanation of the annual budget. Rosenstengel (39) recognized that publicity given budget items may be used to the disadvantage of the schools by various taxpayers' associations, but held that public support of the schools depended upon public enlightenment and that schools had more to fear from an uninformed public than from an informed one. B. Peterson (37) analyzed state laws requiring public hearings on budgets and concluded that such hearings are desirable. Brokau (6) recommended the presentation of the budget in condensed form, presented frequently and in a form understandable by the public.

Administration of the Budget

A number of writers (16, 30, 39) found that a frequent abuse of good budget practice was the careless employment of a contingency fund to offset inaccuracies in budgeting. Mulford (30) scored the failure of a state budgetary law to provide for transfers from one account to another and thus to make the budget a flexible one. A. W. Peterson (36) said that the school accounting system was one of many tools available to administrators to aid in control. Rosenstengel (39) held that the budget was a means to an end and that it could not be considered apart from the educational program. Soldinger and Erickson (42) compared good school accounting practices with good practices in business accounting and held that in administration of the school budget, the school superintendent should follow the lead of business practice but should evaluate the outcomes not upon "profit" as represented by an underspent appropriation but upon the school educational program. Rosenstengel (39) and Grose (20) recommended use of a budget calendar by which budget-making could be carried on continuously and simultaneously with administration of the budget in current use. McNeely (25) and Rosenstengel (39) held for continual analysis of expenditures which would lead to future budgeting. Most writers (4, 18, 20, 22, 42) place responsibility for budget administration on the superintendent.

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CHAPTER V

Accounting, Reporting, and Insurance¹

WILLIAM E. ARNOLD with the assistance of W. B. CASTETTER

IN THE APRIL 1938 issue of the REVIEW the reviewer commented that "there has been little research in the field of financial and property accounting since 1935." It is discouraging to report that the same comment holds at the present time. The paucity of research in this field in no way signifies the absence of vital but unsolved problems. "This condition is probably due to the fact that too few of our educational workers are familiar with these problems and too few by training or experience are prepared to attack them" (2). There is, however, evidence of improvement in practice throughout the country as well as increased interest in the problems connected with fiscal administration. Many state departments of education are continuing their helpful activities in the form of improved accounting systems for use in local school systems (1).

Financial Accounting

The most far-reaching study in recent years of business and financial practices is the New York Regents' Inquiry (13, 15). Moe (20), who directed the studies of school business management, observed that "there are at least nine different accounting systems published and in general use in New York State, exclusive of those systems which have been developed locally." Members of the Inquiry staff devised an accounting system (35) for all except common school districts. Morey (22) reported that thirty-nine states have some provisions for uniform financial accounting. Of these, nineteen have laws requiring uniform systems. Sweitzer (42) prepared a glossary of one hundred business and accounting terms which he recommended be understood by school administrators. A more extensive glossary was published by the National Committee on Municipal Accounting (30). The terms defined are equally applicable to schools. Scates (37) described new criteria for accounting codes adapted to tabulating machines.

Internal accounting—"Internal accounting in public schools is that part of the transactions within a school district which concerns the receiving and paying out of money which is collected from sources other than the ordinary ones of state aid and local taxes," according to Osborne (32) who grouped such accounts into three classes: (a) the school activities for which the board of education advances money from the general fund for the operation of the project; (b) the internal activities for which the board of education pays periodic bills and then receives refunds in the form of fees and service charges; (c) those student activities under whose operation the

¹ Bibliography for this chapter begins on page 182

various group or class organizations contribute funds or raise money as the result of these activities. Schmidt (38) described the New York State differentiation of funds into two groups: funds raised and managed by students, and tax money. The accounting procedures for extracurriculum and activity funds vary widely, and in the opinion of Fowlkes (12) are unsatisfactory in most school systems. He urged the National Association of Public School Business Officials to create a committee to study "the financial and business status of extracurriculum activities in local school systems." Such a committee was appointed and is undertaking the study. The auditing of student accounts was studied by Collum (4).

Transportation—Tisinger (43) reported a study of present practices in accounting for pupil transportation in which he found "that no two states appear to report their transportation costs in the same terms, and, so far as could be learned, no state has a complete system in operation where the terms used have been adequately defined." The Municipal Finance Officers Association (27) prepared an excellent bulletin on accounting for government-owned motor equipment which contained numerous suggestions applicable to public school transportation. Almost every state department of education has prepared some suggestions for records to be used in pupil transportation. There have been other valuable contributions such as those of Meadows (19), Molsberry (21), Noble (31), and Reeder (34).

Miscellaneous—Fenton (10) studied the administration and accounting for student loan funds in higher educational institutions. Cunliff (6) proposed a plan of cost accounting for plant maintenance in which he suggested a breakdown of expenditures by individual buildings into units. The Municipal Finance Officers Association (28) published a bulletin, *Accounting for Public Property*, which contained numerous suggestions of value. Another study worthy of mention is a publication of the Public Administration Service (9) titled *The Security of Public Deposits*.

Various Financial Records and Forms

Records should be primarily functional and their number should never be multiplied beyond the point where their use justifies the cost and labor involved in maintaining them. However, as pointed out by Durkee (7), it is economy to spend sufficient money on records so that those charged with supervision of operating responsibilities will have data to aid them to economize and operate efficiently. An example of the efforts of Florida to develop an improved system of record and report forms was described by Morphet (24). A committee of teachers, principals, and county superintendents cooperated. Special attention was given to textbook and transportation records. Two reports issued by the Committee on Public Administration of the Social Science Research Council should be of interest to school business administrators. One of these (39) suggested a system for recording purchase requisitions for budgetary control purposes. The recommended system is designed as a more efficient method of encumbering de-

partmental accounts with purchase requisitions. The second of these reports (40) presented interesting suggestions for coordination of the preparation of forms. Rathbone (33) described a system of financial forms he developed which are adaptable to smaller school systems. Among others, he presented forms for requisitions, inventories, budget estimates, and employees' time records. Corbin (5) devised a system of accounting records and financial reports to meet the needs of small, endowed colleges. The Chicago uniform textbook record system described by Jones (17) contains many features which can be adapted to the needs of other schools. The system includes a central master system of records covering all phases of purchase, distribution, and care of books; an individual school master record; a room or division record for each teacher; elementary-school library records; principal's master textbook records; textbook depository records; and textbook binding records.

Interstate Comparability of Data

The problem of financial records and reports has been complicated by an apparent conflict between the need for sufficient uniformity to afford state and national statistics, and the requirement that records and reports fit local needs. The U. S. Office of Education is at the present time working in cooperation with the departments of education in the forty-eight states on a study of records and reports which it is hoped will do much toward the solution of the problem. Alves (1) suggested three types of data which should be collected through state systems of records and reports: (a) data required for providing effective local administrative, supervisory, and instructional services, (b) data required by states to reveal the effectiveness of the state programs of education; (c) data permitting the comparison and consequent evaluation of the educational situation in local communities and other subdivisions of the state as well as in entire states. The chief of the Division of Statistics of the U. S. Office of Education (11) recently said: "The cause of much of the difficulty in reporting debt service items is the confusion between functional accounts and fund accounts. In general, the U. S. Office of Education is chiefly interested in reporting income by *source* and expenditures by *function*, regardless of the fund into which money goes or from which it is spent."

Auditing

Morphet (25) analyzed provisions for auditing school accounts in several states and concluded that (a) all auditing services for school accounts should be rendered by a central auditing agency rather than by local or private agencies; (b) expenses of auditing school accounts should be borne by the state; (c) a periodic audit should be made of all local accounts once per year or more frequently when necessary; and (d) auditing service should be rendered by an impartial and independent state auditing

agency rather than by the state department of education. Morphet also proposed criteria for differentiating between auditing services and policy controls (23, 26). Collum (4) made a study of audit procedures for student funds.

Annual Reports

The superintendent's annual report is frequently an important analysis of the financial and business activities of the school system and as such must be based upon complete and accurate data. Public reports influence the number and kind of internal records of a school system. Recently there has been a tendency to present financial information arranged in graphical and pictorial form. McClellan (18) reported a survey of opinion regarding contents and methods of making annual reports. Hunt (16) made a somewhat more extensive study designed to determine present practices in the issuance of annual school reports. His findings revealed that generally annual school reports are of the traditional type with a high degree of uniformity and little effort to vitalize them. He recommended that much of the detailed and analytical material be deleted and that these reports be prepared with more appeal to the reader. However, *The Nation's Schools* (36) recently observed "a somewhat modified trend away from the pictorial type of report started a few years ago by New York City and subsequently used by most of the larger city school systems of the country. New reports are illustrated with both photographs and charts but the trend is decidedly in favor of more reading matter. They are also far less elaborate than a year or so ago."

Insurance

A research committee of the National Association of Public School Business Officials has recently extended a study which was originally published in 1932 (29). The original investigation of fire insurance of public school property has been brought up to 1937 and additional studies have been made of liability insurance, automobile and bus insurance, and such forms as windstorm, sprinkler leakage, boiler explosion, and other types. The report has not yet been published. Baker (3) made an intensive survey of structural and fire-protection features, fire-prevention practices, and amounts and costs of fire insurance in the school districts of Oakland County, Michigan. Farrow (8) prepared a score-card for the evaluation of school insurance programs. Two recent studies have resulted in conclusions favorable to some form of state insurance of public school property. Gruelle (14) recommended the inclusion of public schools in the state insurance fund which covers state-owned properties. Steinhauer (41), in Pennsylvania, concluded that "school districts of this state can and should organize and operate a cooperative insurance association"

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CHAPTER VI

Educational Costs and Their Analysis¹

WAYNE W. SOPER

THE COST OF publicly supported schools is engaging the attention of educators and laymen as never before in American educational history. There is a general tendency to ask why costs are high and what is the probability of reducing them. Parcells (35) warned that school costs must be justified. It rests with the board to scrutinize costs, inform the public, see that the schools give value received, and stress the fact that public education is the bulwark of democracy. Saylor (37) went even further by saying that we need scientific evidence of the schools' accomplishments to convince the public that the price of education is not too high. A study of certain Illinois schools (9) revealed that children in low-cost districts lagged from four to five years behind those in high-cost districts in reading, arithmetic, language, and geography. Reasons given were more poorly trained teachers, less equipment, fewer special services, and fewer, if any, extracurriculum activities. Teachers were urged to help keep the public enlightened on the trend in school costs by the Research Division of the National Education Association (25) which pointed out that increased costs are due to changes in the purchasing power of the dollar, the amount of school services, and higher standards.

School and Governmental Costs

The New York State Teachers Association (30) showed increased costs in all governmental services between 1920 and 1932, followed by a decline in the cost of some services and by continued increases in others. Goldthorpe (15) presented facts to show that education for the nation as a whole consumed 17 percent of the tax dollar as against 25 percent for national defense, 18 percent for interest and debt payments, and 16 percent for highways. That a very small percent of the national wealth is being spent on education was Peterson's conclusion (36). After prefacing his remarks with the statement that the citizen receives more for his money from governmental services than from any other major expenditure, Soper (41) pointed out that several factors must be controlled before costs for different services can be accurately compared, such as, satisfactory unit costs, multiple nature of governmental activities, overlapping of services, quality of services, and distinction between a continuous service and an available service. In another study Soper (42) showed that although the costs of all governmental services have increased considerably

¹ Bibliography for this chapter begins on page 187

in New York State since 1920, the proportion of governmental expenditures going to education dropped from 33 percent to 23 percent. Public benefit, on the other hand, consumed 28 percent of expenditures at the beginning of the period and 38 percent at the close; interest increased from 5 percent to 12 percent. The National Education Association (25) showed that the percent of national income spent for public schools had varied little since 1923, and that the percent of total government costs going for school expenditures had shown a sharp decline.

Unit Costs and Cost Trends

The U. S. Office of Education has continued its series of per pupil costs for city schools (7, 8) which began with "Statistical Circular No. 1" covering the school year 1921-22. The Research Division of the National Education Association (25) reported the trend of school costs for the United States from 1870 to 1936. These costs were related to various other trends and explained on the basis of several component factors. Two reports on unit costs in colleges and universities (22, 45) have appeared. A number of studies have reported costs for particular areas and intervals of time. Two studies of costs in Ohio (19, 34) showed that the large city costs of that state were below the national average in 1936-37. Scates and Baetz (39) reported a ten-year trend in unit costs for Cincinnati and called attention to the defects in official expenditure figures as a basis for calculating costs. They showed the changes needed to make expenditures officially reported to the state comparable from year to year. Similar changes, they indicated, should be made before costs are comparable from city to city.

Braham (3) and Burnham (5) compared the costs in Nebraska with those in other states and showed that in ten years, from 1926 to 1936, Nebraska costs had dropped from \$88 to \$67. Chisholm (6) and King (20) presented comparative data for Texas. Harris (17) and McCuiston (21) compared costs of schools for Negro children with those for white children. Both Morgan (24) and Staffelbach (43) reported data for California schools. They stated that elementary-school costs reached their peak in 1930-31 when they were approximately \$102 per pupil in average daily attendance. For three successive years thereafter costs for elementary schools dropped until they were \$87 in 1933-34; but increases in the next five years brought the 1938-39 cost back to the level of 1930-31. Costs in high-school districts reached their peak in 1929-30 at \$192, after which they dropped to \$142 in 1933-34 and rose to \$160 in 1938-39. Morgan (23) also reported data for 186 California high-school districts in which for 1937-38 the range in current expenditures per pupil was from \$105 to \$628. The New York State Teachers Association (27) attributed much of the increased cost of education to expansion of secondary education. One-half the increase in state aid between 1926 and 1938 in that state

was due to increased attendance in the secondary schools. Furthermore, most of the increase in secondary-school attendance was in the smaller places where transportation and other costs due to centralization were higher

Technics of calculation—Grace and Moe (16) employed a new unit, “the standard enrolment unit,” which means one pupil enrolled in one school subject for five 45-minute periods a week for 180 days. Such a unit, they claim, provides costs valid for comparative purposes. Scates (38) and Scates and Baetz (39) described and applied a method of getting a series of average per pupil costs for a school system without their being affected by the fact that high-school enrolments have been growing faster than elementary enrolments. Because of the more rapid high-school growth during the past half century, citywide pupil costs are becoming so heavily weighted by this factor that they distort the trend of costs for a typical school pupil. The method involves the calculation of a quantity index number which yields cost trends suited to administrative use, and also equalizes different proportions of high-school students when cost comparisons between cities are made

Factors Affecting Costs and Lateral Cost Comparisons

Lateral comparisons of costs (those at any given time) may be made between states or other governmental units, between types of areas (urban and rural), between schools for different races, between different kinds of school organizations, and between the same services in different schools or different services in the same school. The New York State Teachers Association (29) pointed out that comparisons are useful if all factors are considered, such as (a) results obtained, (b) climatic and geographic factors, (c) manner of accounting, and (d) differences in price structure in states or localities. Burke (4) states that comparisons should consider salaries, class size, overhead costs, and interest charges. Sexson (40), referring to California in particular, showed that differences in costs arise from various factors—salaries, supervisory staff, administrative overhead, recreational program, and special services. The Educational Research Association of New York State (26) described the characteristics of an adequate analysis of costs and stated that the basic issue was one of deciding what elements of an educational program can be financed at the present time.

Although for the schools he studied, Enlow (11) found that schools under five hundred pupils in average daily attendance cost \$70 per pupil while those over five hundred in ADA cost \$60 per pupil, he was doubtful of any saving if the smaller schools were closed, since most of the small schools were in sparsely settled areas where transportation is costly. Faulty school organization was blamed by Weber (46) for some of the excessive costs. Albert (1) reported that the plan to increase aid to the

primary grades in West Virginia lessened aid to secondary schools in certain counties.

Commenting on comparative costs between states, the New York State Teachers Association (28) pointed out that costs in the state were unduly weighted by the New York City metropolitan area where costs are high. Cummings and Sackett (10) found that New York State would have to expend an amount considerably above the national average to provide an adequate program. However, while New York State paid more per pupil for education than did any other state, Grace and Moe (16) divulged that this state carried less of a tax burden to do it. These authorities assigned as one cause of high costs in New York State the large number of small schools in rural areas. To reduce costs they recommended closing the one-room schools and increasing class size in other schools. The New York State Teachers Association (31, 32) showed how urbanism in New York State affected school costs, while Fitzpatrick (12) and Foster (13) presented comparative data for rural and urban school districts. The cost of guidance was discussed by Allen (2) who indicated that the cost of such service is largely the problem of how much can be afforded. Herlihy (18) reported on expenditures for school plant operation, stating that 60 percent of the total cost of such service goes for wages of the employees. Tisinger (44) agreed that transportation has grown to be a major cost item, but admitted that its analysis is difficult because of lack of reliable data.

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CHAPTER VII

Regulation and Limitation of Credit to Boards of Education¹

R. L. JOHNS

MANY STUDIES have been produced by noneducational authorities and agencies concerning the use of credit by governmental agencies including boards of education. Since 1930 educational authorities have taken an increasing interest in this field. The financial plight of the schools during the depression in the early thirties, and the excessive use of credit by boards of education between 1920 and 1930, had much influence on stimulating research on the borrowing practices of boards of education. Halsey (11) pointed out that bonds issued by state and local governments in 1927 were more than double the amount issued in 1919. Kimmel (15) reported that in 1936 state and local governments issued 382 million dollars of refunding bonds as compared with 21 million dollars in 1929, whereas new bond issues for schools in 1936 were half those of 1929. State legislatures consequently passed numerous laws from 1930 to 1940 affecting the borrowing powers of boards of education.

The two most common uses of credit by boards of education are the issuance and sale of long-term bonds to finance school building construction and the securing of short-term loans in anticipation of current tax collections. However, boards of education sometimes use other forms of credit, such as charge accounts, lease-rental payments, certificates of indebtedness to creditors, and interfund borrowing. Furthermore, short-term loans (5) for current expenses in anticipation of tax collections sometimes become long-term loans by the process of paying floating debts through the sale of long-term funding bonds. Usually boards of education are invested with the authority necessary to secure both short-term and long-term loans, subject to certain controls, but this is not universally true. Eggert (8) pointed out that the power to negotiate short-term loans in North Carolina is vested in the county commissioners; in South Carolina, in the county treasurer and the county supervisors on application of the county board of education; in Tennessee, in the Quarterly Court; and in Connecticut, in the town board. Smith (22) reported fourteen states in which some or all of the city school systems are dependent upon city or county governments for their bonding powers. During recent years another type of school borrowing authority has come into being generally for the purpose of avoiding restricting debt limitations. This type of borrowing authority generally takes the form of a holding company or a public corporation. Owen (19:115) stated. "The present period will be

¹ Bibliography for this chapter begins on page 195

remembered for the creation of special governmental agencies or 'authorities,' bodies empowered to render public services to the people of a state or a subdivision thereof without pledging the credit of the state or its subdivision, accomplishing for the latter what its regular government officials could not do because of existing debts and debt limitations." Research studies revealing the extent of this type of borrowing and its influence on the borrowing policies of boards of education are not yet available.

Constitutional Controls on School Borrowing

Holmstedt (12:21-23) classified state control of public school finance as "constitutional controls, statutory controls, and administrative controls." He reported in 1940 that the state constitutions of twenty-seven states limited bonded indebtedness for schools and that fifteen states had constitutional provisions limiting local tax levies for schools. Smith (22) reported in 1930 that twenty-five states had constitutional limitations on school bonded indebtedness and that thirty-eight states did not have constitutional debt limits on the tax rate for debt service on school bonds. The Tax Policy League (23) reported that during 1934 and 1935 seven states embodied in their state constitutions provisions which limited in one way or another the tax-raising powers of local governments. Apparently the unfortunate practice in some states of incorporating in state constitutions inflexible provisions regulating school finance continued during the period 1930-1940. Holmstedt (12:42) stated, "Constitutional restrictions . . . have in many instances proved to be almost insurmountable obstacles to the development of an efficient state school system." The reasons usually given for imposing constitutional debt limits on boards of education are to insure lower interest rates and to protect taxpayers. Smith (22), however, found practically no correlation (.02 percent) between the severity of debt limitation and interest yield and, as has been pointed out above (19), special "authorities" are being created in some states to do school borrowing when constitutional debt limits prevent school authorities from constructing necessary buildings. Smith (22) reported that twenty-five states limiting school indebtedness by constitutional provisions set an average limit of 7 percent of the assessed valuation. After converting the rate limitations to percent of real valuation, he found that the average constitutional debt limitation for schools was 2.9 percent of the real valuation of property. He recommended statutory limitation as preferable to constitutional limitation because of greater flexibility.

Statutory Controls on School Borrowing

Statutory controls of school borrowing change from year to year. Smith (22) in 1930 reported that twenty-two states had statutory limitations on the issuance of school bonds; these were in addition to the twenty-five

states with constitutional limitations. Only one state, Maryland, had neither constitutional nor statutory limitations. Davis (5) in 1938 found great variation among the states. Eggert (9:40) in 1939 reported forty-four of the forty-eight states as having set up regulations governing short-term borrowing by school districts. "The statutes generally specify (a) the amount of borrowing that may be done, (b) the funds against which borrowing may be made, (c) the maximum interest rate that may be paid, (d) the purpose for which the borrowed funds may be used, and (e) the group or individual authorized to negotiate the transaction." Eggert (10) found no general agreement among the states as to the percent of anticipated revenue which may be borrowed but that the limits usually ranged between 50 and 75 percent of the current tax levy. Holmstedt (12 23) in 1940 listed the types of statutory regulations of both long- and short-term borrowing of schools. Whereas Smith (22) in 1930 reported only ten states as limiting the tax levy for debt service, Holmstedt (12) in 1940 found twice as many; there were respectively twenty-six and forty-five states limiting the amount of school bonded indebtedness by statutory provision. Limitations on school borrowing are increasing both in number and severity.

Most states have laws requiring a vote of the people to authorize bond issues. In a few states, according to Smith (22), only taxpayers can vote on bond issues. He stated (22 60) "Most of the states now require a popular vote to authorize a bond issue, 32 states requiring a majority vote, 5 states requiring a three-fifths vote, and 7 states requiring a two-thirds vote." Davis (5:32) reported: "One-half of the states require a favorable vote of the electors to issue bonds, and all except 5 of the other half require a vote of the electors to issue bonds under certain conditions." Holmstedt (12) listed thirty-one states as requiring a popular vote to authorize bond issues. Owen (19) stated that "most states allow schoolboards to issue bonds without the consent of the voters, up to a certain limited percentage of the assessed valuation."

Holmstedt (12) found forty-seven states now limit the time of maturity of bond issues. However, a statutory time limit on an original bond issue may in effect be no limit if the statutes authorize refunding and extending the term of payment. Davis (5:31) stated: "Forty states provide for the refunding of bonds, 18 for the funding of temporary indebtedness, and 10 for the funding of warrants. At least 16 states provide for the funding of temporary indebtedness and warrants which were originally incurred for current expenses only." The median maximum time limit of school bonds for all the states slightly exceeds 20.9 years. Statutes generally require that short-term loans be retired during the fiscal year in which the loans are made (8).

Holmstedt (12) listed twenty-seven states as requiring serial bonds. Davis (5:31) stated: "Serial bonds are required in 30 states. The general tendency in recent legislation is toward serial bonds. Thirty-four states

definitely limit the time which may elapse between the date of a bond issue and the date when payments on the bonds shall begin, the average length of which is slightly less than three years." It is possible that Davis classified long-term securities called "warrants" in certain states as bonds which Holmstedt did not so classify. Serial-type bonds are generally preferred to other types of bonds because of interest savings, avoidance of the administration of large sinking funds, temptation to defer payment by refunding, and preference of the investing public (3, 4, 5, 22). Davis (5) calculated that bond interest cost could be reduced 22 percent in Pennsylvania if the serial type of bond could be substituted for other types of school bonds.

Forty-one states regulate by law the maximum interest rates at which school bonds can be sold and forty-five states prohibit sales at less than par, according to Holmstedt (12). Twenty-five states set the maximum rate of interest on short-term loans. Davis (5) stated that at the present time the interest rate frequently paid by boards of education is considerably less than the maximum permitted by law.

Administrative Controls on School Borrowing

There has been a tremendous expansion during recent years of administrative law in the federal government and in state governments. This trend has affected the use of credit by boards of education. Holmstedt (12:24) stated:

The lack of well-established standards and the need for adaptability to local educational needs and desires are adequate grounds to eliminate many types of financial control from detailed statutory regulation. The fundamental purposes of many phases of control can be served adequately only when there is flexibility and adaptability in administration. Statutory controls generally lack these qualities. It is possible and desirable for the legislature to control through general directions and specifications and permit the administrators to exercise such discretion in carrying out the instructions of the legislature as is necessary to accomplish desired objectives. This arrangement may require that the administrative body assume limited legislative and judicial functions, but such are within the power of the legislature to confer.

Holmstedt (12:25) listed, as controls exercised by state officials, check on legality of bonds in forty-three states and approval of amount and purpose of bonds in eight states. The line of demarcation between statutory regulation and discretionary administrative law is not always clear; it is probable that administrative law operates to some extent in any state in which state officials or boards are given statutory power to approve bond issues. The recency of the trend to require state approval of bond issues is indicated by the fact that Smith (22) in 1930 did not even list approval by state officials or boards. Owen stated in 1938 (20:82), "There is a general tendency for legislatures to place the issuing of bonds by local districts or municipalities under some form of supervision," and

again in 1939 (19:121), "State approval of local bonds is being more and more required."

In Alabama (21:581) the state superintendent of education approves long-term securities called "warrants" issued by boards of education for capital outlay purposes. He approves both the amount and purpose of the issues, and boards of education cannot borrow money to construct buildings unless such buildings are recommended as needed by the survey staff of the State Department of Education (17). Lawson (16) recommended state operation of bonding programs, state purchase of securities of local units, state supervision and state aid in planning capital outlay programs. Holy (13) found that 320 of the 385 school bond issues voted on in Ohio in 1937-38 were submitted for the purpose of constructing school buildings at centers recommended as permanent in the Study of Local School Units, a survey sponsored by the U. S. Office of Education and the Ohio State Department of Education.

There are other administrative methods by which the states regulate and control credit of local governments. According to the Chamber of Commerce of the United States, in North Carolina (1) bonds of municipalities are marketed through the state department of local government; in Kansas debt service payments on practically all municipal bonds are paid through the state treasurer's office; in West Virginia the payment of municipal debt service charges is made through a state sinking fund commission which has power to collect funds for this purpose from the local governments and there were no defaults on municipal long-term debts in that state throughout the depression. In Alabama (2) an "authority" known as the Alabama Public Schools Corporation, comprised of the state superintendent of education, the state commissioner of revenue, and the state director of finance, is empowered to secure short-term loans in anticipation of current state tax collections for schools. The Corporation borrows money on a short-term loan basis at the rate of 1 percent per annum, whereas local boards of education had been paying an average of 5 percent. The power to secure short-term loans is not taken away from local boards of education but the need for such loans has been largely eliminated.

Recommended Procedures for Limiting Credit

Most of the available educational research relating to the use of credit by boards of education is descriptive rather than evaluative in character. State legislatures during the past few years have enacted into law many measures regulating and limiting the use of credit, and the desirability of many of these measures is highly questionable (12). Morphet (17) recommended a plan, similar to the Alabama plan, which should result in more effective controls than those commonly established, and would obviate the need for voting bonds or limiting bond issues in proportion

to the assessed valuation, thus inadvertently discriminating against the poorer districts. Holmstedt (12:61-62) suggested the following criteria for the purpose of evaluating state control of local borrowing: "(a) Local school bonds and long-term notes are restricted to the financing of capital outlay. (b) Adequate tax levies for debt service are required by law. (c) Limitations on the amount of bonded indebtedness which may be contracted are based on the real value of taxable property. (d) State regulations of local bond issues require adherence to accepted standards of form and procedure. (e) Provisions are made for short-term loans to cover temporary shortages in funds, such loans to be limited to the estimated amount of revenue to be received during the remainder of the fiscal period." Holmstedt (12) also recommended state review and approval of local budgets and state control of auditing and accounting.

The Chamber of Commerce of the United States (1) made certain studies and recommendations which are typical of the recommendations of non-educational authorities on this subject. The following (1:22-23) were suggested as functions of a state agency for controlling local borrowing: "(a) cooperative help in developing improved accounting and reporting methods, and standards of debt control and debt administration; (b) authority to require good budgetary practice, including adequate budgetary provision for debt service; (c) requirement that an irrevocable tax levy to cover debt service be made when bonds are issued; (d) annual audit of all sinking funds; (e) regulation of short-term borrowing; (f) assistance to municipalities in marketing their bonds to facilitate sales under favorable terms; (g) direct state control to correct defaults; and (h) supervision over proposed refundings, including approval of refunding bonds before issuance."

Although there is considerable similarity between Holmstedt's recommendations and those of the Chamber of Commerce of the United States the following important differences exist: (a) Holmstedt recommended that control be exercised through the state board of education and the state department of education, while the Chamber did not differentiate between school bonds and bonds of other local governing bodies, assuming that state control should be administered by some state agency such as a state department of local government; (b) Holmstedt emphasized the importance of flexibility of state controls from the standpoint of local boards of education while the Chamber placed relatively greater emphasis on the protection of the bondholder.

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CHAPTER VIII

Implications of School District Organization¹

EDGAR L. MORPHET

DURING THE PAST three years, three groups of studies have been concerned with the aspects of school district organization relating to finance and business administration. These may be classified as (a) studies and reports related to and growing out of the Local School Units Project, (b) school surveys of various types, and (c) miscellaneous special studies.

The Local School Units Project

THE REVIEW OF EDUCATIONAL RESEARCH for April 1938 reviewed seven state studies growing out of the Local School Units Project. Since that time the reports for the remaining three states, Arizona (8), Oklahoma (25), and Pennsylvania (26), have been completed, and in addition two significant summary reports growing specifically out of the project have been published. The first of these, by Alves, Anderson, and Fowlkes (5), traced the development of the project, presented the major observations relating to each of the ten states, and called attention to numerous significant implications. The second project report, by Alves and Morphet (6), was prepared as a handbook for the guidance of states or communities in carrying on similar studies.

Numerous special studies and reports have grown directly or indirectly out of the Local School Units Project. Discussions and summaries by Alves (4), Holy (18), Fowlkes (12), and Morphet (23) have emphasized the economies as well as the other advantages to be derived from reorganization. An extensive report based on the studies carried on in Texas comprised some 1,813 pages (29). The Washington State Planning Council (33) carried on a study in that state which resulted in recommendations for substantial reorganization that would eventuate in two types of districts. Other states in which similar studies were carried on at the same time were Wisconsin, Idaho, Colorado, and Utah, although there have been no extensive publications based on these studies.

School Surveys and Other Studies of Organization

The Regents' Inquiry into the Character and Cost of Education in the State of New York published two volumes (13, 14) of material of considerable significance for finance and business administration. During the past three years Alabama has practically completed a program of county

¹ Bibliography for this chapter begins on page 201

school surveys begun in 1927. Surveys of ten county and two independent city school systems have been completed since 1937 (1, 2, 3). Florida has carried out comprehensive studies in five counties and special phase studies in several other counties (21, 22). The Pittsburgh (27) and St. Louis (28) city surveys recognized the close interrelationship between the cities and the state system of school support and indicated that revisions in state laws and state plans of support were essential for the solution of some of the financial problems which face these cities. The survey of Montgomery County, Ohio (20), reviewed the program of services provided by the county, townships, villages, cities, school districts, library districts, and other units of government. Specific recommendations were made for the improvement of organization and the coordination of the different governmental units.

Williams of Iowa (35:68) produced evidence to show that "the present school district structure of the state creates serious inequalities in the opportunities available to children," and recommended the need for studies that would lead to the establishment of more adequate units. Hall (15) and Weber (34) submitted suggestions for reorganization in certain counties in Illinois. Bateman (9) traced the development of the county unit in Utah and observed that while reorganizations left to a vote of the people have made little progress, legislative reorganizations seem to have had the support of the people. The Minnesota State Planning Board (19) made a study of the existing districts of the state and proposed a plan of reorganization. Cocking and Gilmore (11) pointed out the interrelationship between local school units and the rest of the governmental structure and outlined some of the recent steps taken in an attempt to get away from the handicaps arising from boundaries which are coterminous.

Reorganization and Limits of Attendance Areas

The Educational Policies Commission (24) emphasized the need for reorganization for units of both attendance and administration. The summary volume for the Local School Units Project (5) pointed out that in general the larger schools in the ten states provided far better facilities and assured better retention and progress of pupils than the very small schools. The New York study (14) called attention to the 4,879 one-room schools in the state with less than 20 pupils, and stressed the fact that over two million dollars could be saved annually if these small schools could be discontinued or class sizes increased. Since the Local School Units Project was begun in Ohio in 1935-36 the one-room schools have been reduced from 2,387 to 903 in 1940-41 (18). All states engaged in the Local School Units Project recognized the importance of establishing minimum standards for schools and attendance areas. The Alabama surveys have called attention to a number of instances in which existing schools are so small as to handicap the educational program. In the Macon County

Report (2:51) the staff stated that "studies in over fifty counties show that the one- and two-teacher schools are more costly and less efficient than the larger schools." Both the New York (14) and Florida (22) studies emphasized the fact that there is a desirable maximum (elementary 600 to 800; secondary 1,200 to 1,500) as well as minimum size for schools.

Many authorities have called attention to the importance of careful studies as the basis for proposed school reorganizations. The 1939 Yearbook Committee of the American Association of School Administrators (7:221) stated: "This situation can be corrected only when modern school attendance areas are laid out which conform to the boundaries of the modern community, just as the original districts conformed to the boundaries of the pioneer community." Cocking and Gilmore (11:62) also urged careful studies as the basis for reorganization and pointed out that consolidations have frequently been made "without due consideration to the nature of the topography and the common interests of the people involved." Chisholm (10) made a similar observation regarding developments in the state of Washington.

Modifying Administrative Units

In spite of much discussion only limited progress seems to have been made in most states in reorganizing administrative units. This slow progress has been due to a number of factors, among which Alves and Morphet (6) listed: (a) boundaries of many existing local school administrative units coincide with those of political units; (b) political subdivisions are usually units for fiscal support of schools; (c) the difficulty of effecting a reorganization when some districts are heavily bonded; (d) the system of apportioning state funds as used in some states; and (e) vested interests and a general tendency to resist change. Studies in numerous states have indicated that many of the present plans are make-shift in nature. In some states an attempt has been made to work out a solution through tuition payments from one district to another. Thaden and Mumford (31) produced a map showing that only 22 percent of the land area of Michigan is within high-school districts. Some states have organized high-school districts which are separate and distinct from elementary districts; Williams (35) warned against such a plan of organization for Iowa. A number of states have sought to overcome the difficulties of the small district plan of organization by superimposing intermediate districts of one type or another. This plan, however, presents difficulties unless carefully worked out, according to the American Association of School Administrators Yearbook (7). The Washington State Planning Council (33) observed that although laws authorizing reorganization have been in effect for many years the state has almost totally failed to provide incentives. Many unwise reorganizations were cited not only by the Washington report but by most others reviewed. The need for careful, basic studies has again and again been stressed

Effects of Size of Administrative Unit

If the local school administrative unit is small, the schools are likely to be small and consequently expensive to maintain. Moreover, if desirable administrative and supervisory services are provided, the cost of general control in a small unit will be almost as great as in a larger unit (22). All recent studies agree that the small administrative unit commonly results in excessive costs or inadequate services, or both, and that larger units are seriously needed in many states. Several states (7, 14, 30) have recommended the natural community as the logical unit where a larger unit has not already been established. The Oklahoma study (25) concluded that reorganization, if carried out as recommended, would result in saving from a million to a million and a half dollars through the elimination of small units. The advantages from central purchasing in large quantities on the basis of carefully drawn specifications which are possible only in large administration units or by careful cooperation among small units, are reviewed in Chapter X.

The New York Regents' Inquiry (14) pointed out that some of the smaller districts have had to bond for a long period of years as the only means of constructing buildings and consequently have had excessive interest charges. The larger districts have been or should have been in position to work their way into the pay-as-you-go policy and thus avoid all interest payments. A similar observation was made in the report, *Schools for the Miami Area, Florida* (22), which recommended reorganization of districts and a constitutional amendment to permit buildings to be constructed on a pay-as-you-go basis. Chisholm (10) pointed out that buildings in Washington had often been improperly located because of improper district organization. Holy (17) stated that one of the advantages of the Local School Units Project in Ohio was the fact that practically all bond issues had been for centers recommended as permanent.

Limits of Territorial Units and Political Subdivisions

Reports of the Educational Policies Commission (24), as well as those of practically all other writers in the field of education, have stressed the fact that local school units should not be dependent on existing political subdivisions, even in cities. Cocking and Gilmore (11) pointed out the danger of a misunderstanding of functions because of coterminous boundaries and emphasized the fact that school district boundaries are often not adapted to most efficient service because of this situation. The Alabama reports have stressed the fact that county and city boundaries cannot be taken as boundaries for attendance areas or administrative units and pointed out the fact that adjustments are authorized by law. The Florida reports similarly recognized need for adjustments. Trent and Dawson (32) argued that the county could not be taken as an ideal and rigid unit for that reason. Practically all educational authorities agree with the Educa-

tional Policies Commission (24) and the 1939 Yearbook Committee of the American Association of School Administrators (7) that the boundaries of both school administrative and school attendance areas should follow natural community lines and should depart from the boundaries of political subdivisions when necessary. Noneducational authorities, however, and particularly political scientists, have generally taken the opposite point of view (16).

Fiscal units—In most states the fiscal units coincide with administrative units and with political subdivisions. However, a few states have fiscal subtaxing units for schools which are not administrative units and whose boundaries do not coincide with such units. A number of the Alabama reports have recommended that the county be divided into two tax districts in order to eliminate bookkeeping and accounting for funds in the several districts. Both the Dade (22) and Escambia County (21) reports for Florida called attention to the complexities that arise from existing taxing districts and advocate drastic reorganizations.

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CHAPTER IX

Administration of School Transportation¹

A. R. MEADOWS

THE GROWTH OF SCHOOL transportation has been summarized in recent publications by Reeder (28:1-14), Lambert (13:1-4), Meadows (15:13-18), and Noble (25:1-144). Blose (4) reported statistics from the U. S. Office of Education showing that for the nation as a whole the number of transported pupils increased from 837,000 in 1924 to 3,250,000 in 1936 and the total expenditures for school transportation increased from \$29,600,000 to \$62,600,000 for the same period. Meadows (15:14) pointed out that expenditures for transportation amounted to only \$7,960,000 in 1918. Noble (25:20-21) calculated the increase in the number of pupils transported to school and in the cost of transportation by states and for the United States for 1926 and 1938. He found that the number of children transported increased 287 percent and that school transportation costs increased 182 percent for the period. Each of the above authors anticipated considerable further expansion in school transportation. Meadows (15:17) wrote. " . . . although the number of one-room schools decreased 34,709 during the period from 1924 to 1936, there remained 130,708 one-room schools in the United States at the end of the period."

Determining the Need for School Transportation

Reavis (27:21) in 1920 was one of the first to furnish scientific proof of the need for school transportation for purposes other than to consolidate schools. He found that attendance was the most important factor determining the quality of work and that " . . . distance from school is the strongest factor influencing the attendance of pupils enrolled in the rural schools of the five Maryland counties included in this study." In 1926 Mort (21) included the consideration of transportation costs in rural communities as an element in determining the cost of a minimum educational program. In 1927 Burns (5) proposed sparsity of population as the basic factor beyond the control of a local schoolboard affecting the need for transported pupils and in 1928, Johns (10) refined the technics proposed by Burns. Johns (11) later proposed other factors controlling the need for school transportation, pointing out that uninhabited areas and areas in which pupils may be expected to walk to school should be excluded from calculations in deriving the density of population factor. Applications are discussed in the next section.

¹ Bibliography for this chapter begins on page 210

The Alabama State Department of Education since 1927 has directed transportation surveys in fifty-nine of the sixty-seven counties in the state and resurveys of eight counties. The 1939 Survey of Chilton County (3:43-85), through the use of spot maps showing the location of pupils, roads, and recommended school centers, mapped out each school bus route in detail and recommended the number, size, and method of ownership of the buses needed in the county, in terms of the recommended school organization. Lambert (13:47) commented: ". . . from these first-hand studies, particularly those in Alabama by Baxter, Morphet, and others, those in California by Staffebach and by Proctor and Mayo, those in Arkansas by Dawson and Little, and those in Utah by Nuttall and others, there comes a clear concept of a dynamic social order in which educational needs and programs are continually being modified and improved."

Methods of Apportioning State Aid for Transportation

Most of the research studies on state aid for transportation have divided the factors influencing the cost of transportation into two general classifications, controllable factors and noncontrollable factors. Factors beyond the control of the local schoolboard include the distance buses must travel in order to transport pupils, road conditions, natural barriers to transportation, and climatic conditions. Controllable factors are those factors which the board can control through administration and supervision. Reeder (28:148-49) reported that Hutchins, in 1938, found the following practices among states:

1. No state funds for pupil transportation—23 states, including all those not listed below.
2. Equalization districts receive some aid on transportation expense—5 states, including Arkansas, Indiana, Maryland, New Hampshire, and Utah.
3. A low flat rate per pupil is allowed all districts for pupil transportation—3 states, including Massachusetts, Texas, and Wisconsin.
4. The cost, but not exceeding some maximum, is allowed from the state fund—5 states, including Florida, Massachusetts, Michigan, Minnesota, and Ohio.
5. A fixed percent of the cost of pupil transportation is allowed to each district—4 states, including Mississippi, Montana, New Jersey, and New York.
6. Some factors closely related to the cost of pupil transportation are recognized in determining the cost which is recommended and paid from the state fund—5 states, including Alabama, Minnesota, Oklahoma, South Carolina, and Washington.
7. The state pays the full cost and supplies a state program of transportation—2 states, including Delaware and North Carolina.

Noble (25:176) described the North Carolina plan, stating that "in North Carolina the state owns and operates the bus."

Noncontrollable factors—Burns (5) and Johns (10) found the most significant factor beyond the control of the schoolboard to be sparsity of population. The early work of Burns and Johns has been refined in the Alabama plan of state aid for transportation through the exclusion of the areas in which pupils are required to walk to school (2). Florida found

it necessary further to define the density of population because of the many uninhabited areas in that state, and incorporated the refined technic in the state school laws (7:226-27). The transportable area is defined as including all the area within one and one-half miles on each side of the road used in the transportation of pupils. Hutchins (8) found that the most influential noncontrollable factors are number of pupils transported, density of transported pupils per square mile, and road conditions. The Alabama State Board of Education regulations (2:7-8) governing allocation of state funds for transportation specify the following steps: (a) Group the counties in the state in a minimum of eleven density groups according to the number of transported pupils per square mile. (b) Calculate the average transportation cost per pupil per day based on costs and attendance of the previous year in each density group. (c) Using the average cost per pupil per day as the ordinate and the density of transported pupils as the abscissa, plot the average cost per pupil per day in each density group. (d) Fit a curve to the average group costs and determine the allowable cost per pupil per day for counties in each density group from the curve of best fit. The regulations contain further provisions for special situations.

Noble (25:177) evaluated schemes for measuring transportation needs as follows:

<i>Type of Measure</i>	<i>Equitableness</i>
1. Such measures of transportation as are now used in Alabama, Oklahoma, and Ohio	Complete
2. Objective measures, such as pupil miles, delimited by some minimum distance below which the state does not reimburse for transportation	High
3. Review of local transportation budget by state authorities who determine by administrative judgment the minimum transportation costs which the state takes into consideration in granting aid	Fair
4. A similar system operating within counties	Inferior
5. Actual expenditures as determined by the districts	Inferior
6. Flat grants awarded in lieu of transportation The Pennsylvania plan of providing \$200 in perpetuity for all one-teacher schools abandoned is this type of measure	Low

Lambert (13:50-85) attacked the use of density of population in estimating the amount of state aid. If, however, proper consideration is given to uninhabited areas and to areas in which pupils walk to school, Lambert's objections to the density of population factor can be met, and have been met successfully in Alabama, Florida, Ohio, and Oklahoma (19).

Controllable factors—Hutchins and Holy (9) listed the most significant controllable factors as follows: (a) pupils transported per bus, (b) average investment per pupil, (c) number of trips per bus, (d) seating arrangement (percent facing forward), (e) percent of bus capacity used, (f) average number of bids per route, (g) percent of buses owned by the board. Where the items listed by Hutchins and Holy are not included as factors

in arriving at the cost of a needed transportation program, controllable factors, if recognized at all, have been recognized largely through the use of the actual cost of transportation the previous year. However, as pointed out by Meadows (15), the latter procedure has the serious fault of tending to perpetuate unsafe and inadequate transportation facilities.

Federal Support for School Transportation

The need for federal support of school transportation corresponds, to some extent, to the need for federal support of public education as described by the Advisory Committee on Education (1), Chism (6), Mellett (17), Mort (20), and Norton (26). If a state cannot be expected to provide an adequate public school program without federal aid, such a state cannot be expected to provide adequate school transportation without federal aid. In describing improvement of the present measure of need for interstate use, Mort (20:71-77) presented a refined procedure for arriving at the cost of transportation; but in his study the average expenditure for school transportation in the state was an important factor. Mort pointed out that such a measure failed to account for the fact that in some states much more is expected of parents in the way of providing transportation at their own expense than in others and that states less liberal in their provisions for transportation than other states would be penalized by this method of computation. The Advisory Committee on Education (1:53) made the following comment: "In many cases, potential needs for transportation have not yet developed into actual needs. The Committee therefore recommends that those States desiring to use Federal aid in part for transportation be required to allocate Federal funds for transportation separately from other Federal funds." It appears that when federal support for public education is made available there will be an insistent demand for the recognition of school transportation as part of the cost of a needed program.

Management of School Buses

Lambert (13), Meadows (15), Morphet (19), Noble (25), and Reeder (28) agreed that the state should set up general standards for safety in the operation of school buses, should provide qualified supervision and consultative services to local school administrative units, that local school administrative units should implement state regulations and set up such other regulations as may be necessary to meet local conditions in providing adequate, safe, and economical transportation, and that the main school served by each bus should exercise daily supervision of school transportation. The Southern States Work-Conference Committee on Transportation (29) proposed a comprehensive set of rules and regulations for adoption by all Southern states.

Ownership and maintenance of school buses—Practically all the studies on the method of ownership of school buses have reported that buses owned by school administrative units have been operated more economically and more satisfactorily than under any other type of ownership. This is especially true in the studies reported by Lambert (13:119) and Reeder (28:163-70), and made by Meadows (15:179-202) and Noble (25:199-278). Each of these writers summarized studies made by others on the problem of ownership of school buses. The Southern States Committee concurred in this point of view and submitted specific suggestions relating to purchasing procedures designed to promote economy (29). The state of North Carolina, through a school commission separate and apart from the state board of education, purchases, owns, and operates all school buses that are publicly owned. Meadows (15:182) reported that North Carolina transports more children to school than does any other state in the nation, and with the lowest net cost of any state, but suggested that the low cost was partly due to the fact that the state purchases the equipment and fuel, makes its own repairs, requires double duty of about half the buses in operation, and also overcrowds the buses.

The limited research available on repair and maintenance of school buses suggests that county-owned bus repair shops and subcentral shops are preferable to repair and maintenance through contract with private shops (29). A survey of the central school bus shop for Jefferson County, Alabama (16), showed that the county board of education, which owns and operates over one hundred school buses, could effect savings and improve its inspection, maintenance, and repair services through subcentral shops at schools served by seven or more buses rather than through servicing and repairing all the buses at one central school bus shop. Noble (25:320-44) reported that superintendents of rural school systems prefer schoolboard-owned garages, and listed suggested personnel and salaries of school bus shop employees, also school bus inspection reports used in certain states.

School Bus Specifications

The *Minimum Standards for School Buses*, developed and approved by representatives of the forty-eight state education departments in the April 1939 Conference (22), represented jury judgment and experience on specifications for the school bus body and the school bus chassis. This conference report is designed to secure safety and economy in school bus construction. Detailed specifications are given for seventeen major items on the school bus chassis and twenty-six major items on the school bus body. Meadows (15:31-114) discussed specifications for school buses in detail and presented supporting data on many of the recommendations made by the National Conference referred to above. In addition, correct wheel rim size and dual rear wheel spacing are reported for different

size balloon tires and high-pressure tires. According to actual experience and estimates, wood bodies last a little more than half as long as all-steel bodies, and composite wood and steel bodies last about seven-tenths as long as all-steel bodies. Case reports are given on school bus accidents and the resulting injury to pupils in wood, composite, and all-steel bodies. Noble (25:279-313) reviewed the minimum standards for school bus construction developed by the representatives of the forty-eight state education departments, and urged that the states which have not already adopted these standards do so at the earliest possible date. The National Education Association (23) presented an excellent summary of the legal requirements on transportation in 1936, and made the recommendation that school buses be constructed of all steel. The National Safety Council of 1936 published a bulletin on the safe design and operation of school buses (24).

The School Bus Driver

Meadows (15:115-45), Noble (25:346-76), and Reeder (28:33-60) each suggested lists of rules and regulations for employing drivers, for driver operation of school buses, and for driver supervision of transported pupils. These studies indicated that a driver should have special training for the job, should be of good character, should be required to pass a physical examination showing that he or she is free from organic disease; is not a drug addict; has good use of arms, hands, feet, and legs; can meet standard eye tests at least with glasses, has good hearing; and has sufficient strength to manipulate the school bus. Evidence was presented to show the necessity for state and local standards governing the school bus driver (19). The 1940 Southern States Work-Conference (29) proposed definite standards for all transportation personnel and suggested part-time employment of bus drivers in school building maintenance and repair work.

Liability of Schoolboards and Transportation Insurance

The general tort liability of schoolboards is reviewed in Chapter XIII. Meadows (15:237-43) tabulated and reported 104 superior court decisions rendered in the United States on tort of schoolboard members and their employees in connection with physical injury to pupils or other persons from school property, covering the period 1927-1939. Verdicts were rendered against boards of education in California, New Hampshire, New York, South Dakota, Tennessee, Washington, and Wisconsin. In Tennessee, in each case the court held that the liability of schoolboards was limited to the amount of liability insurance carried by such boards, but that schoolboards as agents of the state are not liable for tort in general. Reeder (28:79-91) pointed out that, in the absence of a statute imposing liability, school districts are not subject to liability for accidents.

Insurance—Van Ausdal (30:24) investigated school bus insurance in Ohio and found that indemnity payments from private insurance companies amounted to a net return of only 3.4 percent on the premium payments for the year 1938. Noble (25:489) conducted a questionnaire study on insurance costs and claims paid by insurance companies and found that paid indemnity claims amounted to only 12 percent of the cost of insurance. Noble concluded that there is a need for either the establishment of lower insurance premium rates or properly organized state programs of transportation insurance. Noble (25:495) found that when the premium dollar is divided into expenses and claim expense, premiums paid to insurance companies in connection with school bus transportation resulted in a 42 percent profit to the insurance companies. Meadows (15:244-52) briefly described the North Carolina law authorizing and directing the state school commission to provide compensation for school children killed or injured while riding the school bus to or from the public schools of the state. He made an investigation which showed that returns on insurance premiums paid by school administrative units amounted to zero in some cases and in no case studied exceeded the premium paid. Where insurance is carried with private companies, the recommendations of Joyner (12:51) and Johns (10:99) should be followed.

School Bus Routes and School Bus Schedules

Morphet (18, 19) made suggestions, based on actual field work in school surveys, for laying out bus routes and removing road hazards. Little (14:9-11) discussed the planning of bus routes, time on the road, and waiting stations. Lambert (13:86-116) dealt with the time factor in school bus routing and school bus schedules and reported his study of calculation of empirical norms. He suggested that the earliest time pupils should be required to board the school bus in the morning is seven-thirty. Reeder (28:15-31) stressed the importance of planning transportation routes and suggested twelve procedures for planning school bus routes and schedules. He recommended that, except in unusual cases, pupils not be required to spend more than one hour on the bus in either the morning or afternoon and that a maximum of forty-five minutes, or even less, is better. Meadows (15:146-78) recommended that the school bus schedule be a time and place schedule. He produced technics and procedures for mapping out school bus routes and making schedules, and illustrated their application to a school administrative unit. Noble (25:377-402) described desirable characteristics of a bus route and presented technics which may be used in planning routes. He found that only seven state departments of education maintained pupil transportation offices, leaving, in an overwhelming majority of the states, the planning of bus routes to local initiative, tending toward unsafe and unduly expensive transportation.

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CHAPTER X

Supply Service¹

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THERE HAS BEEN no effort in this chapter to bring specifically to the attention of those interested in educational research the growing literature in supply management which has been developed by trades and industries even though much of it may have an absolute or adaptive value for school business management. The chapter has been further delimited through earlier studies in the field by Fowlkes (16) and Hibbert (20). Much that is included in the chapter may be labeled research only by courtesy. It is included, however, because in a field in which scholarly inquiry has been limited, it looms as perhaps the most significant opinion and thought available to those interested in supply management.

Selection of Supplies

A study by the National Association of Public School Business Officials (37) of 297 schools revealed the fact that 22 percent of the schools entrust selection of supplies to an individual while 78 percent hold to a combination plan. Combinations involve the principal, business manager, supervisor, board of education, committee, and other agents and agencies. The study revealed that the bases for selection for supplies were (a) courses of study, (b) personal opinion, (c) teachers' requests, (d) textbook requirements, (e) supervisors' recommendations, and (f) judgment of the superintendent. There is general agreement among writers in the field of school administration, such as Barr, Burton, and Brueckner (3), Ford (15), Goodier and Miller (17), and Koos and others (29), that the instructional staff should have a voice in the selection of instructional school supplies. Strayer (44) pointed out that standardization of supplies must not be carried to the point that the standards conflict with educational aims. The development of standards must be a continuing, cooperative enterprise in which the using agencies work with representatives of the department of supplies. Abbott (1) urged principals to use the teachers' requisitions for supplies and equipment as an aid in developing the educational program in their schools. The teacher's requisitions will reflect to some degree his abilities and professional attitudes. The principal's policy in regard to materials and facilities of teaching should have an influence in stimulating teachers to achieve the well-rounded, child-adapted educational program he and they have planned. The Association for Childhood Education (2) has listed the needs of the primary grades, kindergarten, and nursery schools for supplies and equipment.

¹ Bibliography for this chapter begins on page 217

Purchasing

Moe (33) recommended the centralization of the purchasing authority under the superintendent, and Jimerson (24) pointed out the need for definitely designating the official responsible for purchasing. Engelhardt (13) suggested that the purchasing division should arrange for periodic surveys of its practices. He would have the teaching and supervisory personnel participate in these surveys and would have them consider changes in the standardized lists, ways of securing greater economy, and promptness of service. The question of local purchasing is one that is always before the purchasing agent. Huggett (23) found some unethical practices carried out by school districts to favor local buying. He recommended that this problem be handled with tact, fairness, and careful attention to the interests of the school and district. Yerge (48) described a handbook on the standardization of supplies and their procurement which has been developed by a committee of the California Association of Public School Business Officials. He stated that the purpose of the handbook is (a) to encourage the school districts to adopt the practices of simplification and standardization; (b) to advocate and stimulate the greater use of specifications in the purchase of their standard supplies, and the testing of materials offered or furnished by the successful bidder; and (c) to discourage the use of lax and uneconomical practices by promoting sound business principles.

Specifications—Hassemer (18), Koopman (28), McAllister (32), Moe (33), Moss (36), and Strickler (45) emphasized the need for a specification which will enable the seller to learn what is wanted and the need for a definite program of inspecting and testing materials as received. Opie (39) discussed the matter of specifications from the viewpoint of the seller and requested that in the name of fair play the purchasing agent should state what he means and then not award an order for inferior material. Boedecker (5) offered information on specifications for soap while Kirk (27) presented some facts to be used in the purchase of paint. Most of the writers in this field agree that purchasing should be primarily through competitive bids. Jimerson (24, 25), however, found that there is a deplorable lack of sound business procedure in the purchase of school supplies. He concluded that the chief difficulty has been that proper specifications have not been available to purchasing agents. He suggested that every purchasing agent make use of specifications developed by the governmental agencies, that some specifications can be secured from sources such as trade journals and association publications. Again assistance can often be secured from dealers or manufacturers in the preparation of specifications; these should be checked with other dealers or manufacturers.

Testing Goods Delivered

To check goods for quality Jimerson (24, 25) suggested that one might (a) avail himself of the certification plan of the National Bureau of Stand-

ards, (b) require vendors to make a sworn statement that the product sold meets the specifications, (c) submit samples of goods delivered to government or commercial agency to test, or (d) test with facilities available. Hibbert and his committee (21) suggested establishment of testing laboratories by the National Association of Public School Business Officials, utilization of the laboratories of the National Bureau of Standards and the universities, and a published black list for "fly by night" companies that persistently furnish supplies inferior to specifications Crawford (11) found, as a result of experience in the Muskegon schools, that testing of delivered materials must not be done by one person but by cooperative testing within the system or, better still, by a plan of cooperative testing worked out by several small systems in which committees could be formed to work together in gathering, checking, and classifying simple tests for school supplies.

Burns (7) presented the procedure followed in Baltimore in setting up standards and tests for various supplies. Testing is done for three purposes. (a) testing throughout the year to determine what the specification is going to be; (b) testing specifically before making awards; and (c) testing after the article is delivered to see if it is equal to the sample on which the award was made. In determining standards classroom requirements are completely analyzed. Ernst (14) was not so interested in what is in a product as in what it will do. He stated that the heart of the specification is the section headed "tests," and the most satisfactory and conclusive test is that of actual use. Morphet (35) pointed out that faith in a manufacturer's product or label may be justified from experience but it is no insurance against errors in manufacture or a decision to change manufacturing standards. Baumgartner (4) stated that generally speaking the cost of tests should not exceed 1 to 3 percent of the money value of the material to be inspected.

Cooperative Purchasing

Moe (33) in the Regents' Inquiry recommended that a part of the program of the state education department be devoted to encouraging (a) cooperative purchasing, (b) stimulation of competition, (c) development of standard specifications, (d) inspection and testing of goods delivered, (e) control over goods in storage Morphet (34) noted that the small school's problem of selecting and purchasing satisfactory equipment and supplies at a reasonable price is a difficult one as the principal usually has neither the technical knowledge nor the time to devote to the problem. He urged that small school units be reorganized into larger units, or that a cooperative plan be worked out for large-scale buying and testing, and that the state department of education take the lead in preparation of specifications and testing of products purchased.

Borning (6) reported a plan of cooperative buying of books and supplies adopted and carried out among sixty schools in Hennepin County, Minne-

sota. Teachers and principals made out their requisitions which were sent to the county superintendent's office. School supply firms bid on the combined order with delivery to each school included in the price. The superintendent and an assisting committee of five schoolboard members chose the successful bidder. Each school was billed for its share of supplies and saved about 20 percent of what the cost would have been had the school sent in its own order. Substantial savings were also shown in a California study by Yelland (47). In the study by the National Association of Public School Business Officials it was found that 43 percent of the schools keep purchases within a per pupil cost; 57 percent do not. Forty percent of the 297 schools placed orders with a single company while the remaining schools divided the contracts.

Stores Management

Hibbert (19) maintained that many advantages accrue to school systems in having a central warehouse for school supplies. The estimating of needs becomes easier and more accurate. It is easier to check supplies for quality and quantity, and better control and records can be kept. Clettenberg (8) and Decker (12) favored the central warehouse. Jimerson (24) cautioned against waste due to overstocking. Koopman (28) made several suggestions on storing equipment in the central warehouse. Joyner (26) pointed out the possibilities of salvaging supply materials and equipment through repairs by the maintenance staff. He warned, however, that such repair procedures could be carried to undesirable extremes; labor costs should never exceed the value of replaceable materials. The Southern States Work Conference on School Administrative Problems (43) listed miscellaneous formulas which may be used in the preparation of certain supplies. The list suggested an area of savings through school preparation of simple compounds usually purchased from commercial houses.

Distribution of Supplies

Suffield (46), in a study of instructional supply administration, found that the progressive school must be given more freedom in the requisitioning of supplies than the traditional school—that is, a larger amount of material not appearing on the school's standardized list is required. He also found that schools preferred a money-allotment plan rather than an item- or article-allotment plan to determine the amount which a school might requisition. To assist the principals in analyzing their use of materials, he suggested that supply-consumption studies be made from time to time. Hibbert and his committee (21) found that frequency and methods of delivery of supplies in cities of 15,000 to 20,000 population represent widely varying practices. Thirty-one of 106 school systems which submitted data for the study used a plan of weekly delivery, twenty-nine delivered supplies as

needed without reference to a schedule; nineteen used a plan of monthly delivery; the other systems reported delivery of supplies from daily to annually. Over half of the systems maintained a central storeroom delivery by school-owned truck only.

Textbook Selection and Purchase

The writers who have discussed textbook administration in recent years are largely in agreement that teachers should have a voice in the selection of textbooks. Among the many who have touched on the subject may be listed Ford (15), Goodier and Miller (17), Koos and others (29), and Newsom and Langfitt (38). Most have agreed that a checklist for appraisal and adoption of books is desirable. Ford (15) summarized the instructional attitude reasonably well in his conclusion that books should be selected only after thorough study and experimentation in their use over the period for which they are designed. Early in 1936 the textbook publishers and manufacturers (9) submitted proposed manufacturing standards and specifications for textbooks for the adopting agencies throughout the country. While the need for uniform standards was recognized by the states furnishing free textbooks, there was a general feeling that standards should be prepared cooperatively, with school needs outlined by professional schoolmen. Accordingly, in April 1938, representatives of the publishers, manufacturers, and state departments of education met in Tallahassee, Florida, and later in New York, for a series of conferences. As a result of these conferences the committee (9, 10) has recommended complete minimum standards and specifications for the manufacture of textbooks. These standards involve binding processes, materials, workmanship, and tests for materials. Durability has been assumed provided that the specifications are met in full.

It would appear that some principle of cooperative buying of textbooks in situations not subject to uniform adoption and purchase by large units would have possibilities of saving. In the experiment reported by Borning (6), the sixty participating schools in Hennepin County, Minnesota, purchased their textbooks cooperatively. Unlike the procedure in supply distribution the books were distributed by one superintendent's office. Publishers shipped the books by freight, separately packaged and tagged for each school. Rich (40) emphasized that the costs of books and supplies are very small items in the school budget. He concluded that to save on books and materials is to waste teacher and pupil time and to sacrifice pupil learning.

Textbook Conservation

On the basis of reports from a number of cities, Roberts (41) assumed the average life of the textbook in the hands of pupils to be from four to five

years. Sheeley (42) conducted a study in the care of books in the Kinloch Park School, Miami, Florida, using a control and an experimental group. He concluded that care and responsibility for books can be taught with desirable results either through an activity unit or a teacher-dominated situation. Koos and others (29) pointed out that tolerance of abuse of books, equipment, and supplies is evidence of inefficiency and administrative irresponsibility.

Accounting for books—Taylor, a contributor to Newsom and Langfitt's work, *Administrative Practices in Large High Schools* (38), stressed the value of proper accounting procedures and records in textbook administration. Forms were suggested for a textbook inventory account and a store-room record of teachers' requisitions. Roberts (41) suggested that among the records which should have a place in a system of textbook accounts, the following should be listed: (a) book identification record; (b) perpetual store room inventory; (c) receipts for purchases; (d) records of withdrawals, excess books returned, and those returned for discard.

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CHAPTER XI

Principles, Personnel, and Management in Business Administration¹

FREDERICK W. HILL and LELAND W. MOON

BECAUSE OF THE MULTITUDE of tasks and the need for prompt and efficient performance, it is relatively easy to consider the business activities as ends in themselves rather than as means for achieving the main purpose of a public school system, namely, the education of children. There is also the inherent danger that certain areas of business administration may be overlooked or neglected because of a lack of specific procedures or programs. Studies related to instances of this sort will be discussed in this chapter. It must be conceded at the outset that there are few studies available in many of the areas to be considered. Hence it is hoped that this chapter will stimulate research projects in those areas.

General Principles of Business Management

De Kock (16), in an article based upon a study of school surveys recently made in ten cities scattered from coast to coast, suggested an overall view of business administration as a service organization of which the chief beneficiary is the educational administration. The St. Louis survey report (51) suggested that business administration is an aspect of school administration which has developed slowly and recently. The emphasis in the past has been upon the mechanics of task performance. The need in the future suggests a concentration upon community analysis, problems of taxation, the security of personnel, and broader educational concepts. In the past, workers have not been trained for many of the services which they have performed in business administration. The Pittsburgh survey report (50) presented certain basic criteria for the measurement of business administration in its relationships to the community, in its relationships to the school and community, and in its relationships to the school. The report indicated that there is frequently a tendency to institute certain practices and to follow them even though they may have been outmoded.

Self-evaluation—De Kock (16) stated that a modern school plant cannot be organized or operated on the basis of individual judgment or opinion. The St. Louis survey report (51) expressed the need for a measurement of school business administration to discover such time- and money-wasters as obsolete methods, duplication, failure to standardize processes, performance of services which bring no educational return, or failure to utilize the services or output of other agencies within the community. The Pittsburgh

¹ Bibliography for this chapter begins on page 223

survey report (50) proposed that a research program covering a period of time should be outlined and workers should be specifically assigned to this service. Grill (27) suggested a self-survey for the school business officials.

Office equipment—The Cincinnati survey (54) recommended electrically operated office machines. The Hartford survey (49) suggested the use of a postage meter. Arnold (5), De Kock (16), and Schmidt (46) recommended a degree of uniformity of records and a similarity with state department records. Lewis (31) outlined the use of tabulating machines as an aid to various phases of business administration. Scates (45) discussed accounting codes adapted to tabulating machines.

Selection and Training of Nonteaching Personnel

Davis (15) stated that a hundred or even seventy-five years ago there were few school employees other than teachers. Moehlman (35) suggested a definition of the nonteaching personnel which included all those whose work is essential to the facilitation of the instructional process. The salary studies of the National Education Association (37) showed that for cities over 30,000 in population slightly over one-seventh of all employees are in the nonteaching group. Davis (15) found that in twelve selected cities the nonteaching personnel represented one-fifth of the staff. In rural areas the proportion may be different.

Studies have been published on the work of attendance officers (47), nurses (13), custodians (44), and secretarial workers (8). Crayton (14) proposed certain principles for training of clerical personnel, together with a philosophic evaluation of the work of the clerical service workers. The Cincinnati survey report (54) suggested a policy of clerical and secretarial personnel promotion in connection with a classified civil service. Strayer (51) suggested in-service training for office personnel, that secretaries should be organized into professional study groups (50) for the analysis of their problems, and the production of a handbook and other materials to insure superior practices. Bruce (9) discussed credit unions for the nonteaching personnel. The last number of the REVIEW devoted to the school plant (October 1938) reviewed literature relating to custodial and building service personnel.

Increasing emphasis is placed upon the pre-service and in-service training of the nonteaching personnel. The St. Louis survey report (51) suggested the creation of an institute of school business administration for the improvement of the work in business administration and the stimulation of the workers to a better understanding of their part in the public school system. Strayer (50), in the Pittsburgh survey report, suggested that such an institute should be organized with a definite curriculum covering all aspects of business administration and their relationship to educational needs. The nonteaching group should recognize their obligation to continue their educational training.

Cafeteria Management

Tracy (53) and the Pasadena survey (12) emphasized that the school cafeteria should be under the control of the board of education and under the administrative control of the superintendent of schools. Hull and Ford (28) suggested general principles of cafeteria administration. Bryan (11) suggested the relationship of the cafeteria manager as that of a staff officer. Tracy (53) said that administration of the cafeteria begins with the board's statement of policy, and De Kock (16) mentioned the need for uniformity of policy. Powers (42) stated that administrators should seek to coordinate cafeteria service with the larger educational program; that it is a definite part of the school curriculum and therefore must function for educational ends. De Kock (16) required that the cafeteria should supply meaningful education as well as wholesome food. Lynch (32) reported that the cafeteria should be operated as a nonprofit organization as well as a teaching device.

Bryan (10), Pendergast and Wiles (40), and Powers (42) set standards for cafeteria managers; viz., home economics graduates with a major in institutional management. Pendergast and Wiles (40) reported a training course for prospective cafeteria managers which consisted of twenty weeks of training in five aspects of the work, with internship. Bryan (11) and De Kock (16) advised a training course for both managers and workers. Bryan (11) required that these workers have academic status and salaries comparable to those of others equally trained. Edwards (17) proposed that there be centralized administration, with administrative duties divided between a supervisor and a business manager. Gilbert (26) found that teachers who manage small cafeterias together with a part-time teaching load, thought that at least two hours should be allowed for this service. Barr (6) discussed the handling of receipts, inventories, and bills. Behm (7) presented a double-entry bookkeeping system for use in a school cafeteria operated as a single financial unit. Knoll (29) and Bryan (10) mentioned principles of financial management of the cafeteria. Theofilos (52) offered a checklist for the measurement of cafeteria service which suggested a management plan and a check of the financial accounting.

Administration of Internal Accounts

The earlier works on internal accounting emphasized budgeting, centralizing, and auditing of extracurriculum funds (21, 22). Fowlkes (24) more recently discussed the nature and universality of extracurriculum activities. Mason (34), Slobetz (48), and Laflin (30) emphasized the need for a budget. Arnold (5) suggested that the purchase and custody of extracurriculum supplies and equipment should be a function of the business manager. Laflin (30), Mason (34), Slobetz (48), and Young (57) advocated centralized internal accounting systems. Mason (34) emphasized the need for an annual audit. The responsibility of the board of education

and the administrator for internal funds was treated by Mason (34), Osborne (39), and Wiles (56). General rules approved by the board of education were listed by Young (57). Fowlkes (24) discussed trends in the business management and financial support of extracurriculum activities. Walsh (55) maintained that an internal accounting system should be simple, adequate, and accessible. Mason (34) said the system should be accurate, comprehensive, and easy to operate.

Osborne (39) found the preparation of the budget to be valuable student training in evaluation if proper safeguards are provided. Laflin (30) and Slobetz (48) suggested payment of all obligations by check. Abbott (1) offered a rating scale for surveying internal accounting funds, covering fourteen phases of the internal accounting processes. Fowlkes (24, 25) suggested that the philosophical foundation of extracurriculum activities is badly in need of clarification.

Real Estate Management

Little research is available in this field. Alves, Anderson, and Fowlkes (3), Alves and Morphet (4), and Marsh (33) discussed the importance of long-term study of various factors affecting school districts and city planning. D. C. Rogers (43) offered criteria for selection of school sites in Chicago. Engelhardt (20) mentioned the consequences of inadequate site planning. The Pasadena survey (12) reported the necessity for, and values of, a property register. The New Rochelle survey (38) related general principles of maintenance of real property. There is need for study of the philosophy of real estate management, the relation of nontaxable school property, the effect of public school participation in real estate operation, and policies affecting the use, rental, leasing, and disposal of public school real property. Management of salvage was referred to briefly in the St. Louis report (51). Depreciation management was referred to by Poruben (41) and by Adams (2). Contractual forms for school building construction have been prepared by Engelhardt (19). Checklists on contractual relations within a school building program have been prepared by Morrison and others (36), and on contract relationships between the board of education and the building contractor by Efler and Hosler (18).

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CHAPTER XII

Effects of Legislation and Court Decisions on School Finance and Business Administration¹

M. M. CHAMBERS

Reports and Analyses of Legislation and Court Decisions

THE STANDARD SOURCE of information on a nationwide scale is Keesecker's biennial reviews of educational legislation. In the latest number of this series (48) the following trends in school finance were noted: (a) increased state participation in school support, (b) increasing use of taxes other than the property tax as sources of state school revenue, (c) increasing state control of school budgets, expenditures, and indebtedness, and (d) the establishment of minimum state aid foundation programs of statewide application. Less comprehensive, but reaching the public more promptly, are the frequent articles on school legislation by Chambers (18, 22, 23). For complete and well-organized annual digests of judicial decisions throughout the nation, one turns to the *Yearbooks of School Law*, written by a group of some twenty competent contributors and published by the American Council on Education (25).

Studies of State Laws on Systems of School Finance

The most authoritative published study of a single state was the volume by Grace and Moe (39), prepared for the Regents' Inquiry into the Character and Cost of Public Education in the State of New York. Important changes in state school finance in West Virginia, beginning with the property tax limitation amendment of 1932 and the county unit act of 1933, were ably evaluated by Bolling (7). From the situation wherein property taxes were the chief source of revenue and the state paid only about 5 percent of school costs, the state has shifted to the position where about 55 percent of the expense of the school system is paid by the state from sources other than property taxes. Other valuable studies of West Virginia are the doctoral dissertations of Palmer (67) and Rice (74). Alabama legislation of 1939 effecting increased appropriations to the state school fund, an improved method of apportioning the fund, and an ingenious and successful statewide scheme to save local districts from expensive short-term borrowing were reported by Chambers (21).

Scott (76), studying the effects of the clutch of three Kansas statutes of 1933 known as the "tax limitation law," the "budget law," and the "cash basis law," made a generally favorable report with five suggestions: (a) budget and accounting forms should be prescribed by the superintendent

¹ Bibliography for this chapter begins on page 236

of public instruction (rather than by some other state authority) to avoid multiplicity and overlapping; (b) budget hearings should be discontinued because public interest and actual attendance do not justify them; (c) districts should be allowed to issue emergency warrants up to 25 percent of the current budget and warrants in anticipation of delinquent taxes; (d) boards of education should be allowed to raise the tax levy 25 percent in between-election years, to save the expense of special elections; and (e) boards should be allowed to make reasonable levies for the purpose of accumulating a surplus for future needs.

Taxation for Public Education

In his annual reviews of the court decisions touching school taxes, Yakel (86, 87, 88) presented cases on the various questions relating to the power to levy taxes, what property is subject to taxation, and so forth. Among many other cases he reported the Kentucky decision holding that a city in that state cannot levy a tax for the support of a public junior college except after the proposal has been approved at an election, and the Pennsylvania decision to the effect that a board of education whose members are appointed rather than elected cannot be authorized to levy taxes because this would be an unconstitutional delegation of the taxing power. Looking broadly at the reconstruction of state revenue systems, Dewey (32) advocated "a balanced program, making use of income, general sales and property taxes for major revenues." He also recommended a nonpolitical state tax commission with broad administrative powers. Lemmel (54) declared that the assessment of property is the weakest link in current tax systems and argued that this function for the entire state should be put in the hands of a three-member state tax commission appointed by the governor for terms of at least nine years and including at least one member of the political science faculty of the state university. Wilkins (84) and Witneyer (85) devoted their dissertations respectively to salient aspects of school tax management in Texas and Pennsylvania.

The National Education Association (63) published a condensed but exhaustive tracing of the progress of school tax legislation through the five-year period, 1934-38. Prominent in the picture is the extension of the general sales tax as a source of school revenue to the point where it was in operation in 23 states by 1938. Also prominent were efforts to relieve property taxpayers by enacting homestead exemptions, permissive reduction of state and local levies, and low maximum limits on property tax rates. During the period four states either greatly reduced, suspended, or entirely abandoned the property tax as a source of revenue for state purposes. Three states enacted new laws aimed at greater efficiency in state tax administration, and fifteen states provided for investigations by special commissions. Hudson (46) reported that by the spring of 1939 some form of

special relief from the property tax to home owners was in force in Alabama, Arkansas, Florida, Georgia, Indiana, Iowa, Minnesota, Mississippi, New Mexico, Oklahoma, Texas, Vermont, West Virginia, and Wyoming. He found that there is no conclusive evidence that home ownership is stimulated by tax exemptions and doubted that the exemption is desirable. He concluded that it resulted in higher tax rates on other property and in increased state aid, financed mainly by new or increased sales taxes.

State School Funds

Coffey (26, 27, 28) has made regular annual reports of the judicial decisions affecting state school administration, including many touching the distribution of state funds to the local districts. He noted the New York decision against the constitutionality of furnishing public transportation to pupils in private schools (reversed by constitutional amendment in 1938); the Washington decision that state common school funds could not be used for vocational rehabilitation; the Ohio decision that the state director of education is under no statutory obligation to apportion state school funds to a school district on the basis of the attendance of pupils who reside in another district and actually attend the district in question without proper authority; the Oklahoma decision that the income tax act of 1935, in which the allocation of proceeds to the schools was dropped, did not affect the distribution of uncollected revenues under earlier acts; and many others. A significant aspect of the apportionment of state school funds was explored in Hoffman's dissertation on the effect of state aid in Florida upon local efforts in supporting public schools (45).

Fiscal Consequences of District Reorganization

Studying the whole problem of the organization of units of school administration and support, Anderson (5) found that the creation of more efficient units can be accelerated by devising better methods of apportioning state funds and by simplifying the legal procedures necessary for boundary changes. Hitchcock (44) studied court decisions on the devolution of assets and liabilities when the school district boundaries are altered. He pointed to a need for legislation to cover the subject more precisely and suggested the value of a special administrative court to adjudicate the problems arising.

Borrowing by School Districts

The many judicial decisions regarding the issuance of bonds and other evidences of indebtedness by school districts have been reviewed annually by Owen (64, 65, 66). He has covered the cases relating to debt limitations, the statutory requirement of a balanced budget, elections for bond issues, and various incidents to the issue and sale of bonds and warrants. He re-

ported that in 1938 there was a sharp decline in the number of cases arising out of bank failures but a rise in the amount of litigation growing out of the relations between school districts and federal lending agencies (65). Owen reviewed a number of cases touching upon various forms of cooperation between school districts and other governmental agencies. A city school district in Kentucky, in order to secure a federal loan, transferred title to its school plant to the coterminous municipality. In Kansas a joint plan for the construction of a swimming pool by two school districts, one municipality, and the National Youth Administration was crippled by a decision that the expenditure by one of the school districts was unlawful because it had not levied taxes expressly for such a purpose. The Pennsylvania courts upheld the scheme of allowing the state or a local subdivision to arrange for the creation of a separate corporate authority for a specified purpose, in such manner that the authority thus created could borrow without regard to the debt limits imposed upon the local unit for whose purposes it was created. Approaching the subject from a statewide viewpoint, Lawson (52) argued for a special state board to study all proposed school district bond issues and to provide assistance in planning capital outlays, checking architectural plans, and giving professional service in supervising construction.

Eggert (34) reported an extensive study of short-term borrowing. He constructed a comprehensive table of statutes touching the subject in all states, showing the permissible amount, the maximum interest rate, the prescribed purposes, and miscellaneous statutory regulations. He found wide variations. Some states permit no short-term borrowing while others allow it up to 100 percent of the current revenue. The maximum interest rates were found to vary from 4 percent to 8 percent. Alabama's statute of 1939 created a plan under which short-term loans are obtained for school purposes at a rate of interest of about 1 percent (21).

Real Property and Taxation

Legal aspects of various problems related to the school plant have been treated in an earlier number of this REVIEW (15). Annual reviews of court decisions touching school property have been published by Weltzin (81, 82, 83). He reported cases on such topics as title, reversion, purchase, leasing, and sale of real estate. Of special interest were his digests of the cases regarding self-liquidating plans for financing the erection of public school buildings in Kentucky (81, 82). He also found considerable litigation on the taxability of school property and activities, noting that real property not in use for school purposes was held taxable in Illinois but allowed temporary exemption in South Dakota; that a devise of property for school purposes in Vermont was subject to the state inheritance tax; and that extracurriculum activities involving buying and selling were held subject to the sales tax in Kansas. Chambers (24) reported the Kansas case

and summarized the United States Supreme Court decision holding that state universities are obligated to collect and pay the federal tax on the sale of tickets to athletic contests. Fuller discussed the implications of this latter decision and of the recent elimination of judicial barriers which formerly prevented federal taxation of state agencies and *vice versa* (35).

Contracts for Buildings, Supplies, and Nonteaching Services

Annual reviews of the court decisions involving school contracts other than for teaching services were published by Day (29, 30, 31). From year to year he kept his readers abreast of developments respecting contracts for the employment of attorneys and architects, for the construction of buildings, and for the purchase of school supplies. In connection with these matters he treated contractors' bonds and materialmen's liens. He also touched contracts for the transportation of pupils. One case of wide interest is a Pennsylvania decision holding that schoolboards can lawfully purchase athletic paraphernalia for use by school teams in competitive sports but that the boards should determine the extent of such purchases "in the exercise of a cautious discretion, with special reference to the proportionate number of those who will receive the benefit of such supplies." Reviews of recent cases involving contracts with architects (13) and janitors (16) were published by Chambers, the latter article showing a commendable tendency toward giving all custodial and janitorial workers the status of employees of the school district in lieu of the quaint system of lump-sum contracting for the service in each building as a whole, which persists in some places.

Budgeting, Accounting, and Custody of School Funds

Court decisions interpreting the prescriptive and regulatory statutes applicable to budget-making by school districts were given a penetrating analysis by Hamilton (41), who concluded that the courts are slow to countenance any transfer of educational policy-making to noneducational fiscal authorities and that much of the statutory law has little result except to cause schoolboards to give more thought and planning to their budgets, which is a wholesome consequence. Peterson (68), in his dissertation on school budget hearings, found that thirteen states require such hearings in all school districts and twenty other states require a hearing or an analogous procedure in at least some types of districts. Most of the statutes were enacted since 1920. Though there was evidence of ineffectiveness (two-thirds of the districts reporting had fewer than four citizens in attendance), Peterson recommended that better publicity, better timing, and better conduct of the meeting should be tried. Tolle's study (79) of school budgetary procedure in New Mexico concluded that the educational budget auditor should be an employee of the state board of education and that the power to adopt school budgets should rest with independent local

boards of education. Martin's dissertation (58) set up an imposing list of principles of school accounting and attempted to show to what extent the forty-eight states fall short of putting them into practice.

Mowls (61), studying the protection of school funds, put principal emphasis on safe custody. He reported that personal bonds covering the faithfulness of custodial agents were less satisfactory than corporate surety bonds, and recommended that the school district should pay the premiums on all such bonds and obtain them from surety companies approved by the state authorities. He was not enthusiastic about state insurance but reported more favorably upon the work of the state banks in North Dakota and Delaware, and upon that of the Utah state depository board. Real estate and mortgages he regarded as relatively unsafe either as investments or as collateral to protect school funds on deposit

Fiscal relations with other civil units—Looking into the fiscal relations between school districts and other civil bodies in 191 cities of 50,000 or over, Bolmeier (8) reported that in 151 of these cities the school budget must be submitted to state, city, or county authorities. However, in only seventy-seven such cities does the budget go to a city official or board, and in only sixty-six do the city authorities have any power to review or revise it. Moreover, in many of these instances the extent of the power is so circumscribed as to be negligible. In forty-one of the cities it is limited to changes in the lump sum only. Bolmeier collected similar information regarding custody of school funds, auditing, levy and collection of school taxes, and the issuance of school bonds. Bolmeier's findings were condensed to form one chapter in the otherwise debatable report published by Henry and Kerwin (43) in which the fiscal independence of school districts (and, indeed, their existence as corporate entities) was opposed. The report seemed to confuse fiscal control of schools by non-educational municipal authorities with cooperation between the schools and related departments of the municipal government. The two are in fact quite distinct, and either can exist in high degree without the other.

Muller (62) marshaled five cogent reasons why schoolboard budgets should be free from interference by noneducational fiscal officers: (a) usurpation of full administrative control follows fiscal control, (b) division of authority and responsibility produces conflict and inefficiency, (c) interest and enthusiasm wane when fiscal independence is lost, (d) long-term planning is impossible without fiscal autonomy, and (e) the mere size of the educational function in the local fiscal picture justifies its independence. Morphet (60), charting the line between auditing and educational policy-making, pointed out that the proper sphere of auditing includes inspection for the purpose of ascertaining the fact of fraud, misappropriation of funds, or the financial history or position of a board of education as shown by an analysis of receipts and expenditures for a given period or at a stated time, but that the determination of educational policies to be followed in providing an educational offering of maximum

benefit to the public is not the function of an auditor. He indicated that auditors frequently overstep their bounds and cited a glaring example.

Tort Responsibility

In the course of his annual reviews of the higher court cases touching the tort liability of school districts and school personnel in all the states, Lockenour (55, 56, 57) explained the California statutes which extensively modify the common-law doctrine of nonliability and reviewed occasional cases deviating from the doctrine in other states, especially New York. He sharply criticized the theory, advanced by some courts, that anything a school district does is a governmental rather than a proprietary function and therefore carries immunity from tort responsibility. He also properly assailed the peculiar Iowa doctrine that even the employees of a school district are personally immune from liability for their own negligence while performing a governmental function. Studying the tort liability of individual employees and officers of school districts, Dice (33) recommended that school districts be required to assume liability for the negligence of their agents and compelled to carry insurance covering that liability.

The most recently published substantial study of the tort responsibility of school districts is by Rosenfield (75). He argued convincingly that the common-law immunity from liability should be abrogated in the interests of justice to innocent injured parties. He also considered the possibilities in improved methods of reporting accidents, more explicit communications by the school authorities and parents regarding pupil activities, the creation of special schemes for the indemnification of pupils injured in athletic contests, and general liability insurance, with the possibility of states or large cities creating and maintaining their own insurance funds for that purpose. Investigating the liability for injuries in school transportation, Punke (73) illuminated the distinction which some courts set up between an agent of the district and an independent contractor when fixing liability. The distinction is most often pertinent in California, where the district may frequently be held liable under the statutes. He also reviewed some of the recent cases in several states showing a trend toward holding school districts liable to the extent of their own recovery from the insurer, when they hold indemnity insurance.

Public Aid to Nonpublic Schools

A historical study of public funds for church and private schools is contained in Gabel's dissertation (36). He urged that a maximum of religious liberty together with a maximum of educational opportunity would be consonant with the advancement of a democratic society. Kearney (47) reviewed the leading court decisions touching nonfinancial public aid and financial aid (both direct and indirect) to private sectarian schools

and their pupils. He concluded that the question is now one of degree as to what particular benefits available to public schools and their pupils may be extended to private and sectarian schools.

Kindred (49, 50, 51) went into the same subject in his doctoral dissertation. He found that all state constitutions except those of Maine, Vermont, and Maryland have restrictive clauses, some forbidding appropriations to any institutions not under exclusive control of the state, and others merely forbidding aid to sectarian institutions. Illinois, Indiana, Louisiana, Maryland, Massachusetts, New York, and Kansas were reported as having statutes permitting free public transportation for pupils in private and parochial schools. Connecticut, New Hampshire, and Vermont permitted this for nonsectarian private schools only. Louisiana, New Mexico, and Indiana provided for free textbooks for children not in attendance in public schools. Louisiana included school supplies. Such provision of textbooks was once declared unconstitutional by the New York courts but was sustained by the courts of Louisiana and by the Supreme Court of the United States (49). Maine and Vermont give outright state financial aid to private schools. Of more current interest today are the indirect forms of aid, including not only such services as free transportation and free textbooks but also free water and light, and health and safety services to pupils (49). Some of the foregoing questions, including also the use of public school funds and property for nonschool purposes, were treated in Pizor's dissertation (69). He reported the growth of a broader attitude toward the function of education as well as an extended concept of the nature and use of public property and noted a progressive tendency to modify the rigid legal limitations on its use.

Federal Aid for Public Education

The well-known report of the President's Advisory Committee on Education and the nineteen staff studies, constituting an imposing array of evidence showing the desirability and inevitability of federal aid to the states for general education, have received much attention in other chapters of this issue. It is appropriate to note here Hamilton's special study (42) of the legal aspects of the subject, in which he concluded that there are no insuperable constitutional or other legal obstacles to the program recommended. The educational press has carried many solid articles in support of the principle. One of the most interesting of these was Swift's summary (78) of school finance in England and France, showing both of these countries to be far in advance of the United States in the proportion of the cost of education supplied by the national governments. In England this proportion was reported as somewhat over 50 percent. In France the state pays all teachers' salaries, encourages their marriage, gives maternity leaves and allowances for dependent children as well as "milk bonuses." The state also makes grants for school buildings.

The annual reports by Punke (70, 71, 72) of court decisions involving federal grants and loans for the construction of school buildings constitute a valuable record of the period during which this activity was carried on under the Federal Emergency Administration of Public Works. He reported the judicial reasoning on the several controverted questions, such as the combining of the local and general welfare, the application of the prescribed stipulations regarding labor standards, the avoidance of stalemate because of a too rigid adherence to debt limitations, and other legal incidents of obtaining a vast improvement in the national school plant through cooperation by the federal, state, and local governments. A briefer resume of the court decisions on PWA and the schools was published by Chambers (17), noting that the legal pathway is clear for a resumption of a similar program whenever Congress may see fit.

Finance in Higher Education

Looking at philanthropy as a source of support for higher education, with special reference to the twenty years since 1920, Goldthorpe (38) recommended that the privately controlled colleges and universities study and safeguard their tax-exempt status and take three other steps: (a) carry on institutional self-surveys and work toward the coordination of educational programs involving several institutions on local, state, or regional bases; (b) carry on long-range planning to promote gifts and maintain an organization within the institution for that purpose; and (c) strive to convey to the public a better understanding of the broader purposes and procedures of higher education. "Political and educational activity of a broad statesmanlike character is one of higher education's most serious needs," he said. In his special study of the effect of the federal income tax exemption, the same author noted that an increasing share of private gifts is going to tax-supported institutions, and that, in general, income-taxpayers are utilizing less than 2 percent of the maximum exemption of 15 percent allowed by federal law (37). He concluded that there is apparently little real cause for alarm that a more even distribution of incomes among the people would necessarily have any bad effect upon the financing of educational and philanthropic institutions.

Notable work has been done by the Financial Advisory Service of the American Council on Education. From 1935 to 1940 it produced eighteen bulletins on various aspects of college finance. Typical of these are the two most recent ones, being respectively a guide to proper auditing procedure both for the institution and for the public accountant engaged in auditing its accounts (12) and a study of the diversification of the investment portfolios of 110 institutions holding endowment funds aggregating about one and one-quarter billions (2). A recent manual described how to establish an accounting system in a teachers college and how to coordinate the budget, the accounting system, and the financial reports (59).

A plan for determining equitable appropriations to the state teachers colleges of Pennsylvania was treated in Lecron's dissertation (53).

For the varied legal problems in the administration of higher education one turns to the annual reviews of court decisions by Brody (9, 10, 11), Chambers (14, 19, 20), Spencer (77), and Weaver (80). Therein are treated cases touching the financing of buildings, tax exemptions, tort responsibility, and the validity and execution of educational trusts. On the last-mentioned topic, a thorough exploration of the legal position of trustees of endowment funds has been made by Blackwell (6), tracing the history of the two pertinent judicial doctrines with special reference to the state of Missouri, but also embracing a study of the relevant decisions in some twenty other American jurisdictions.

The survey of Louisiana State University by the American Council on Education (3) embraced a study of the business organization and management of the institution. The survey of public higher education in Utah by the Council (4) recommended unification of the control of the several institutions under one governing board and also made specific recommendations regarding financial support and administration. The exploratory study of cooperation, coordination, and regionalization in higher education prepared for the American Council on Education (1) embraced some of the legal problems involved, including those arising from restrictions in the charters of privately controlled institutions and those growing out of the dearth or obscurity of legal provisions governing interstate agreements between and among state institutions.

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CHAPTER XIII

Emerging Conceptual Patterns in Finance and Business Administration¹

FRANCIS G. CORNELL

THIS CYCLE NUMBER of the REVIEW, the fourth in the series on finance and business administration, marks a decade of digests of research in the field. From Cubberley's *School Funds and Their Apportionment* in 1905 to the first cycle number published in 1932, research in school finance had earned a respectable position among fields of scientific inquiry. The history and evolution of study in educational finance through this period has been recorded in previous numbers. As we enter the fifth decade of the century we find, with all the shortcomings of our particular specie of research, encouraging evidence that the pioneer efforts of the past quarter century are being followed through. Indeed, that the preparation of this volume itself is in the hands of members of the second generation of investigators in school finance, is some evidence that our field is coming of age.

In scanning previous cycle numbers on finance and business administration, one notes that reviewers have been persistently critical of the extent to which literature in the field has been genuinely research in character. Contributions of former periods have been assessed as chiefly providing an increase in factual knowledge through the publication of complete and accurate descriptions. Methodology has been criticized as lacking the "controls" and "technic" or "experimentation" such as marked the scientific advance of research in instruction and the curriculum. Reviewers have repeatedly commented upon the superficiality of studies. All these things, we must admit, are true. We all know it. But if we redirect our energies properly, what of the future?

Summarized in the pages of this volume are inquiries which may be viewed with some degree of optimism. Research in the field is gaining in breadth of perspective. Technical progress has been made in the keeping of books for income and expenditures of educational enterprises. Researchers, in running short of problems dealing largely with traditional mechanisms, have been forced to extend their inquiries into the many areas within which the problems of school finance must be considered and into the practical research which enables application of scientific inquiry and the diffusion of desirable practice in the operation of American public schools. Research in finance and business administration, in attaining a stature of maturity, is being thrown against a backdrop of political theory, economics, public finance, sociology, and a broader conception of the whole pattern of American life.

The organization and integration of the knowledge and guiding prin-

¹ Bibliography for this chapter begins on page 243

ciples into a "conceptual pattern" is beginning to take shape in rather specific terms. The chapter by Mort (8) in the Holmes committee report is a good sample of a synthesis of the problem area of school finance which could not have been written a decade ago. It has been for want of an integrating perspective that the study of problems of financial support and fiscal management of schools has been subject to criticism. It is true that much of the trivial matter which has appeared in published form has been the result of lack of coordinated effort and unity of perspective. Emerging conceptual patterns are forcing us to search for values and criteria far transcending enumerations of dollars, average daily attendance, and classrooms. The remedy, in part at least, will be the development of clear-cut *direction* and facilities with which studies may be knit into some meaningful whole.

Reviewed in this volume are large-scale studies in areas of school finance the like of which are mere suggestions of what inevitably the future will demand. Former attacks on the problem of federal support, for example, seem dwarfed beside the nineteen staff studies by the Advisory Committee on Education (1). The scope of studies by the Regents' Inquiry in New York State (6), though not limited exclusively to problems of finance, indicates something of what will have to be done in the future to lay out fiscal problems in terms of the many ramifications to which they lead. Regardless of how one appraises undertakings such as the work of the Advisory Committee on Education or the Regents' Inquiry and subsequent undertakings in New York State, one must agree that they indicate that we are getting down to bedrock.

We are beginning to realize that research in school finance is, after all, concerned ultimately with the problem of ordering our particular form of economy to the service of public education. We have, in simplest terms, three elements with which to deal. One of these we may call our economic system. Another we may call educational service in its most comprehensive sense. The third is the particular pattern of controls which American democracy has set up for administering public education. Students are beginning to recognize all three in attacking school fiscal problems. The writer, having been immersed for a period of five years in a smallscale but intensive study of this nature now being published in collaboration with Mort (9), is perhaps somewhat biased in emphasizing this as a hopeful and encouraging direction for research to take in our field. The writers attempted, among other things, to strengthen the understanding of methodology. In attempting to relate financial factors to the educational program itself, some workers have discredited approaches using statistical methods and the mathematical formula. But in discovering the limitations of methods of quantification many have made the mistake of largely denying the usefulness of statistical methods.

In the above study, the "educational program" was measured by statistical means in terms of "adaptability" or the extent to which schools

have taken on newer authenticated best practice. Other factors included were economic, cultural, professional, and administrative. It was found possible by statistical analysis to explain all differences in adaptability, not attributable to chance or sampling error, among wealthy and poor, and large and small school districts. By the introduction of time and spatial elements a longitudinal approach was possible, revealing the operational processes of school systems. Various aspects of adaptability have been subjected to detailed study by several doctoral students under Mort Farnsworth's analysis (5) dealt with the introduction periods of innovations. A further study of the developmental aspect of adaptation was made by Bateman (2). Knott (7) examined the effects of "tax-leeway" upon local adaptability of school districts. Cillhé (3) contrasted adaptability under centralization in a large city district with adaptability under decentralization. Ebey (4) applied technics of studying interdistrict variations in adaptability to the study of adaptability within a city school system.

We must avoid restrictions of any particular methodology or point of view and move forward in an effort to make use of the tools which best serve our purposes. It is not impossible that we may expect in the future less polarization of point of view with reference to such matters as the whole or the part method of attacking our problems, the mass description approach versus the limited case study upon carefully isolated factors, or statistical versus nonquantifying methods.

Conditions of school finance and fiscal control may be expected for some time to stand paramount among critical issues to be settled in public education. The contingencies of a highly unstable world economy suggest a myriad of difficulties which we may face within months. If we have truly made progress in improving methodology and broadening our field of vision, we have at least the intellectual resources which have been accumulated in a quarter of a century of research with which to meet a none too certain future. The time may soon be at hand when all the intellectual and mechanical facilities produced by researchers in this field will have to be mustered and coordinated for purposes of speeding up the adjustment of providing an adequate educational service in a new economy and in a new democracy. Our national income and the taxpayer's purse have just begun to feel the pressure of the expanding new governmental services with which public schools must compete for financial support. It is not a question of whether or not education in this country is to face a new crisis, but a question of when and how. There will be new problems. If we are not ready to solve them, they might be solved for us.

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FOREWORD

THIS ISSUE covers one of the new areas or topics placed in the regular schedule for the REVIEW by the Editorial Board at the beginning of the fourth cycle in 1940. It is designed to cover special emphases or needs in philosophy, organization, administration, curriculum, teaching, and research which are called for by children who differ significantly from the main body of pupils in the public schools. It thus includes exceptional children, as the term is conventionally used (mentally, physically, and emotionally or socially exceptional), and racial minorities which present special problems as well as the general problems of bilingual children.

The present topic overlaps at points with certain others. Children from homes and neighborhoods disturbed by poverty, conflicts, and disorganization are discussed, with slightly differing emphases, both here and in the issues on Mental Hygiene and Health Education (December 1940 and December 1936), and somewhat incidentally in issues on Pupil Personnel, Guidance, and Counseling (April 1939 and April 1936). Adaptations in the internal organization of school systems to meet the needs of special groups are dealt with both here and in issues on Organization and Administration of Education (October 1940, October 1937, etc.); but extensions of the school system to include adult, out-of-school youth, and preschool groups, emergency defense education, correctional education, and other specially organized groups or schools, are left entirely to the issues on organization and administration, or those closely related. Children having difficulties with individual school subjects, and needing remedial instruction, are not considered in this issue. With such exceptions, the present issue deals in general with children who may in some way or other be regarded as handicapped for the regular work of the schools and as having specific difficulty in meeting the conditions of life in our society.

Because this is a new topic and preceding treatments are scattered, it may be appropriate to list earlier discussions in the REVIEW which have dealt with various aspects of the present area in an organized fashion.

December	1940—	Chapters II, III, IV, VI, VII
October	1940—	Chapter V, Section B
February	1940—	Chapter III
April	1939—	Pages 180-84
December	1936—	Chapters II, III, V, VI, VII
April	1936—	Chapters VIII, IX
February	1934—	Pages 81-82
June	1933—	Chapter IX
April	1933—	Chapter I

Additional incidental treatments will be found by consulting the annual index in the December issue for topics such as Special Education, Exceptional Children, and Nationality.

DOUGLAS E. SCATES
Chairman of the Editorial Board

INTRODUCTION

THE TERM "exceptional children" has been used, for lack of a better phraseology, to denote those who, by reason of a marked mental, physical, or emotional deviation from a so-called "average," require special school adjustments if they are to fulfil their potentialities for learning and for living. Modern developments in educational philosophy and methods have, of course, stressed the principles of individual differences and of the need of individual adjustment for *every* pupil. The special adjustment measures provided for exceptional children are only an application of this basic philosophy. The authors of the chapters which follow in Part I present the significant studies that have been made during recent years in the effort to arrive at the best possible means of putting such adjustments into operation. Since a knowledge of the psychological background of exceptional children is essential to an intelligent determination of the educational procedures to be used, pertinent psychological studies are reported in the discussion of certain of the groups.

In the great melting pot of American democracy, the significance of the problems presented in Part II is obvious. Under three major headings the educational needs and progress of the Negroes, of the Indians, and of bilingual children of foreign parentage or from foreign-speaking homes are considered. Chapter 9 on "The Indians" is of particular interest because it represents a pioneer effort to bring together the results of studies which approach research in this field. As the authors of the chapter point out, "educational research in the narrower sense has been almost completely absent in the field of Indian education and administration." In Chapter 9 they have given us a report which may well stimulate further developments in the scientific analysis of educational problems that are of special significance to the Indians.

This is the first time in the history of the REVIEW OF EDUCATIONAL RESEARCH that a complete issue has been given to the topics here under consideration. Certain previous issues have, under more comprehensive titles, contained limited reference to one or another aspect of the problems of special education for handicapped and gifted children. Likewise, certain phases of the educational welfare of Negroes have received occasional attention. Problems of bilingualism have scarcely been touched in past numbers, and the education of Indians is a totally new topic. It is, therefore, with considerable gratification that the Committee offers this June 1941 issue to readers of the REVIEW as a report of research in the interests of special groups of individuals, the wise education of whom is of paramount importance to the progress of American education.

The period covered by the research reported in this issue varies with the respective topics, determined at the discretion of the author in the light of the availability of previous reports on the same topic in the REVIEW. Most of the studies reported, however, have appeared since 1935.

The chairman of the Committee wishes at this time to acknowledge the wholehearted cooperation of Committee members and other contributors. Owing to a temporary change in her assigned duties in the United States Office of Education, made in keeping with the needs of the national defense program, much of the responsibility for compiling the material has been carried by Christine Ingram, who has accepted a temporary appointment to the Office of Education as senior specialist in the education of exceptional children. To her, the chairman of the Committee expresses special acknowledgment and appreciation.

ELISE H. MARTENS, *Chairman*
Committee on the Education of Exceptional Children
and Minority Groups

CHAPTER I

General Problems of Philosophy and Administration in the Education of Exceptional Children¹

CHARLES SCOTT BERRY

Problems of Philosophy

THE GENERAL problems of philosophy and administration in the education of exceptional children are not fundamentally different from those involved in the education of children who are not exceptional. The difference is chiefly one of emphasis. The problems of philosophy and administration in the education of all children are determined or conditioned by changes in the social order. According to the Educational Policies Commission (24.6): "Every system of thought and practice in education is formulated with some reference to the ideas and interests dominant or widely cherished in society at the time of its foundation."

Equal educational opportunity for every child, to which we have long given lip service, like "All men are created equal," means much or little depending on how it is interpreted. Its interpretation is influenced by the prevailing interests and ideas of the community. To the old-time attendance officer it meant merely that every child must attend school as long as the law required. To the traditional school teacher it meant that every child should be taught the same subjectmatter in the same way. To the leaders in education, health, and welfare who participated in the 1930 White House Conference on Child Health and Protection (31:47), equality of educational opportunity meant: "For every child an education which, through the discovery and development of his individual abilities, prepares him for life; and through training and vocational guidance prepares him for a living which will yield him the maximum of satisfaction"; and "For every child who is blind, deaf, crippled, and for the child who is mentally handicapped, such measures as will early discover and diagnose his handicap, provide care and treatment, and so train him that he may become an asset to society rather than a liability."

After years of depression during which millions of our people living in a land of plenty were "ill-housed, ill-clad, and ill-nourished," came the beginning of the Second World War in which democracy found itself on the defensive. In the light of ten years of striking and unexpected change, the 1940 White House Conference on Children in a Democracy (32:2) broadened the earlier conception of democracy to include equal economic opportunity and capacity for cooperative living, thereby giving a new meaning to equality of educational opportunity.

¹ Bibliography for this chapter begins on page 259

The Committee of the Regents' Inquiry (14:50) which formulated a new educational program for the state of New York recommended that instruction be organized to provide more adequately for individual differences in children, that steps be taken to reduce the high percent of non-promotion, and that educational provisions for mentally and physically handicapped children be strengthened. The Advisory Committee on Education (2:2) appointed by the President in 1936 reported that a new social attitude toward children had gained wide acceptance, and that this new social attitude had found expression in legislation concerning children; in the extension of child welfare services; in the intelligent interest manifested by parents in providing suitable home conditions for children; in the adaptation of school instruction to the individual needs of children and youth; and in the inclusion of health and welfare services as an integral part of the school program.

These reports of national organizations clearly show that equal educational opportunity for every child involves among other things: (a) recognition of the social, economic, and educational significances of individual differences in children and the importance of making more adequate provision for individual differences in the educational program; (b) greater emphasis on the education of the whole child both as an individual and as a member of the group.

Problems in Administration

For this new and broader interpretation of equality of opportunity to find full expression in educational practice requires the solution of many problems in administration—problems concerned with the child, the nation, the state, the city, and the rural district. To change the traditional or curriculum-centered school to a child-centered school while the school continues to run is a much more difficult problem in administration than it is to reconstruct a railroad bridge while the trains continue to run, the former requires not only changes in buildings, equipment, supplies, subjectmatter, and methods of instruction, but also, unlike the latter, a retraining of the personnel.

Hutcherson, as quoted by Hawkins (15:3), said that "there can be no misfit children. The child is what education is for. One might as well say a man does not fit his clothes as to say that the child does not fit the school. Such a point of view dictates that the school delve deeply into the true nature of each pupil, as an individual, and that the facilities of the school be so utilized that he will achieve in accordance with his special abilities and interests." A fundamental understanding of the exceptional child is essential to the development of his unique possibilities. Without such an understanding there can be no equality of educational opportunity for the seriously handicapped child.

The Gluecks (12:20) reported in their study of criminals that "the most marked difference between the reformed and unreformed lies in the factor of mental and emotional difficulties as evidenced by the finding

that only 15.2 percent of those who reformed were burdened with some psychiatric condition as opposed to 89.9 percent of those who continued to be delinquent or criminal." In a later study of juvenile delinquents they (11:113) found that "a significantly higher proportion of the youths who eventually reformed were without the burden of abnormal mental conditions or personality deviations of one sort or another."

The New York City Bureau of Child Guidance discovered, according to Greenberg (13:103), that children with IQ's of 130 or above had four times their share of personality or social maladjustments. The psychologist, the psychiatrist, the physician, the social worker, the visiting teacher, and the guidance specialist, as individuals, and the child guidance clinic, the child guidance conference, and the coordinating council, as agencies, all play a comparatively new role in the understanding and adjustment of the child who is different. It is the school administrator who must decide how these specialists and agencies can be used to best advantage in the education of the exceptional child.

National and State Programs

Some national organizations have been at work to secure enactment of federal legislation that would provide financial aid to the states for the education of physically handicapped children. During the hearings before the Committee on Education and Labor of the United States Senate (30) on a bill designed to bring this about, it was pointed out that, since the federal government under the Social Security Act is already providing federal aid for the support of dependent children, medical service for crippled children, and vocational rehabilitation for the disabled of employable age, federal aid should also be provided for the education of all types of physically handicapped children. This matter of federal aid for special education remains to date an unsolved problem in administration. Martens (19:36), in her discussion of this general subject, said that we have no national program for the education of exceptional children, "if by such a program is meant a closely knit organization directed by a central agency." She questioned whether such a program was really desirable. She favored a national program "characterized by a nationwide solidarity and coordination of purposes and activities, sponsored by national agencies and applied by every state of the Union in terms of its own needs and through its own administrative arrangements."

One of the most difficult problems in administration is the formulation and execution of a statewide program of special education that will meet the needs of all types of exceptional children. In discussing such state programs Martens (20, 21) said that today every state makes some provision for the education of its blind and deaf children either in residential schools of its own or in the school of an adjacent state. Every state has residential training schools for delinquents committed to its care by the courts and all but three states make some provision for the institutional care of the feeble-minded. Sixteen states have one or more persons on the

staffs of their educational departments who supervise the education of exceptional children on a statewide basis. Some states also are incorporating the state residential schools into the public-school systems of the state.

In the matter of state educational programs for exceptional children, Powell (26) held that such a program should be an integrated part of the general state educational program and should make provision for all kinds of deviates. Ade (1:v), in describing Pennsylvania's state program of special education, said: "It aims to promote an appreciation of the fundamental principle that the public schools are organized and maintained for the benefit of the child, and to eradicate as rapidly as possible that uniformity of educational procedure that ignores in large measure, mental, physical, and personality differences in children."

The "Youth Correction Authority Act" (4:1) was drawn up and adopted by the American Law Institute. It is a model act, the purpose of which "is to protect society more effectively by substituting for retributive punishment methods of training and treatment directed toward the correction and rehabilitation of young persons found guilty of violation of law." The American Law Institute seeks through this Act to secure more effective individualization of treatment and training of youthful offenders.

A City Program

In describing the organization of a city program for the education of exceptional children, Ingram (18.44) said that there are four requisites for a successful program: "First, school health and child study services for individual pupil problems, second, competent administrative or supervisory leadership, third, competent special education teachers, and fourth, a sympathetic and understanding community." The usual and most popular way of providing special education for all types of exceptional children in large city school systems has been by means of the special class or special school. This method of meeting the needs of the exceptional child has been popular because it does not necessarily require any change in the regular grade organization of the traditional school; the special class usually is set up as another class unit in the school. In considering the type of organization best suited to meet the needs of the problem child, Postel (25) took the position that the special school is superior to the special class in that it makes possible better classification, offers a wider variety of activities, has a more elastic organization, is less likely to stigmatize the child, makes it easier to secure psychiatric, psychological, and visiting teacher service, and provides better opportunities for research.

Hill (17.22) also held that the special school has certain advantages. "The advantages for direction and supervision are apparent. The association of teachers of various types of classes for physically handicapped children has undoubtedly created a spirit of cooperation among them and a more intense desire to further the cause of special education" Martin (23:224), while admitting that the special school may be superior in some respects to the special class or classes in the regular school, stated that if

adequate equipment and well-trained teachers were provided, few educators would champion special schools for the major types of exceptional children.

Thompson (29) thought that we had gone somewhat too far in setting up special schools and classes for crippled children who could with proper planning and supervision adjust to better advantage in regular grades with physically normal children. He explained how clinics for periodic examination of crippled children could be held on Saturdays; physiotherapy where needed could be given after school hours at established health centers; and corrective exercises for the average child could be supervised by intelligent parents and teachers. He said that the schools of Maryland, with the exception of Baltimore, had abandoned special classes for crippled children and had inaugurated a suitable program in the regular grades to the satisfaction of children, parents, doctors, and all others concerned. His plan required special transportation and specially constructed desks where needed, and a program of teacher-training designed to prepare the regular classroom teacher to train the handicapped children. To provide special education for the crippled child without special classes or special schools entails some marked changes in the procedures of the grade school.

The Chicago public-school system which, like other large city school systems, has long had both special schools and special classes for handicapped children is now attempting to meet the needs of the less seriously handicapped children in the elementary schools by means of the adjustment service. This adjustment service was begun in ten elementary schools in 1936, and in 1939 (9:264) it was operating in 325 of the 332 elementary schools. The adjustment teacher, who works under the immediate direction of the principal, gives tests, assists the principal in the interpretation of results and in the selection of children who require differential treatment, helps prepare individualized work materials, and coaches the more difficult cases. The fact that the adjustment service has been extended to all but seven of Chicago's 332 elementary schools is some indication of its value.

The United States Office of Education (10) reported that the number of children enrolled in special schools and classes for socially maladjusted children and for gifted children was actually less in 1936 than in 1934, and that the number of delicate children in special schools and classes in 1936, although larger than in 1934, was smaller than in 1932. This seems to indicate that the regular school in the large city is being modified to some extent, so that it is using other ways and means, as well as special schools and classes, to meet the needs of the exceptional child. Strachan (28:63), for example, in discussing ways of caring for delicate children said that "every school should provide for rest and extra feeding, but that it is by no means necessary for special classes to be set up in the school system to meet the needs of these children."

Arbuckle (6) described how Detroit provides special education for children with unusual ability in the visual arts by means of classes which meet after school. One class for the most exceptional children is held each Saturday morning in the Detroit Institute of Arts. Bear (7:121) stated that St.

Louis does not separate bright pupils into special schools or classes. "The St. Louis Schools," she said, "operate on the theory that the capacity for leadership and social service of such pupils can be developed best by keeping them with others of the same grade and age"

Martin (22) sent questionnaires to 30 school systems listed by the Office of Education as reporting special classes for gifted children. Only 15 of the 26 which replied indicated that they had special classes at the time. Some reported that the classes had been discontinued due to the depression, and others that they made a practice of sectioning pupils on the basis of ability but did not provide special classes.

A Rural Program

Berry (8) reported that in cities of 100,000 and over the number of children enrolled in special classes and special schools for all types of exceptional children was equal to about 4 percent of the total public-school enrolment; that in cities of 10,000 to 99,999, it was less than 2 percent; and in cities under 10,000, in villages and rural school districts, it was but a small fraction of 1 percent. He suggested that the large cities had made greater progress in special education than the smaller communities and rural districts not merely because of greater per capita wealth, better trained teachers and administrators, greater centralization of school population, superior means of publicity, and a larger number of agencies interested in handicapped children, but also because the special class or special school has been conceived as the only means of providing special education. Heffernan (16) reported that in two counties in California, supervisors were employed particularly for work with exceptional children. In these counties a pioneer program was being developed. Early discovery and adjustment of minor handicaps were emphasized to prevent later more serious maladjustments.

The Province of Ontario, Canada, according to Amoss (5-73), "adopted the plan of treating the handicapped children as a special educational unit in his own environment. After a period of experimentation, provision was finally made for the organization of units of several kinds." Under the "unit-plan," subjectmatter and methods of instruction are adapted to the needs of the handicapped child without segregation. He is taught by the regular grade or rural teacher under the direction of the supervisor. Cost of special equipment, supplies, and transportation where necessary is borne in part by the provincial department of education.

Conclusions

In the light of this review of recent reports and investigations which bear directly or indirectly on problems of philosophy and administration in special education it is evident:

- 1 That changes in the social order have influenced our interpretation of "equality of opportunity"

- 2 That "equality of opportunity" today is being interpreted in such a way as to give a new meaning to individual differences.

3 That in view of the rapid and unexpected change in world affairs we can expect that the interpretation of "equality of opportunity" will continue to change

4 That the present interpretation of "equality of educational opportunity" has created many new problems in administration

5 That until these important administrative problems are solved the special class or the special school will continue to be the prevailing, and in most school systems the only, means of providing special education for the exceptional child.

6 That marked progress is being made in the solution of those administrative problems involved in transforming the traditional grade school into a child-centered school in which special education becomes an integral part of the school program

Needed Research

Many areas need to be investigated through scientific research directed toward improvement of the total educational process. A general discussion of the kinds of questions which research should seek to answer and the types of research called for, in the field of special education, was presented by Scates (27). Among the specific problems which call for attention are:

1. Development of methods to promote in the exceptional child a greater sense of responsibility to the group. At present the emphasis is almost wholly on the group's responsibility to the child. The "Declaration of Interdependence" (3:12-13) formulated by the American Association of School Administrators might well serve as a starting point.

2. Determination of the best form of state aid for the education of all types of exceptional children. At present state legislation lacks certain essential standardization. The formulation of a model act by the various national organizations interested in the exceptional child in cooperation with the Office of Education would have a far-reaching influence.

3 Designation of the types of exceptional children who can be best educated in special classes or special schools.

4. Experimentation under controlled conditions to determine how successfully the less seriously handicapped children can be taught with children who are not handicapped.

5 Determination of a way of democratic living that will insure the acceptance of the handicapped child by children who are not handicapped.

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CHAPTER II

The Mentally Handicapped¹

NORMA E CUTTS

THE FACT THAT SPECIAL PROVISIONS for mentally handicapped children in the public schools exceed those for any other handicapped group, and that greater aversion exists toward mental defect than toward physical defect, makes mental deficiency a field in which there are many vital problems. Heck reported in the REVIEW OF EDUCATIONAL RESEARCH for June 1933 that he found the literature extensive and research dealing with mental defectives "vast." Since that time much more has been published. This chapter will report primarily that which has happened during the past five years.

The literature has shown considerable lack of agreement in the terms used. Almost any degree of mental handicap was found described by the phrases feeble-minded, mentally defective, mentally deficient, mentally handicapped, subnormal, mentally retarded, mentally inadequate, and slow-learning. This variation in vocabulary has become greater as the school life of the mentally handicapped child has lengthened, because of better enforcement of attendance laws and changing economic conditions. It is difficult to make generalizations from such research as there is, or to use results intelligently, without common agreement in the definition of terms.

Historical Development of Education for the Mentally Handicapped

Frampton (28), Grave (31), Heck (34), and Kuhlmann (51) have given the history of the training of mentally handicapped children. The growth of special education for mentally deficient children in Connecticut (15) was described by members of the state association of special class teachers. Pritchard (82) presented developments of the last twenty-five years in which Leta Stetter Hollingworth was influential.

Identification and Selection for Special Education

Criteria for Identifying the Mentally Handicapped—It is not surprising to find emphasis upon the IQ for identification when Hollingworth, Terman, and Oden (40:53) have said: "Feeble-mindedness is, as in the decade of the 1920's, still defined in terms of IQ and of centile status. For practical purposes persons who test below 70 IQ are called 'feeble-minded' . . . In New York State in 1930, school regulations specified 75 IQ, instead of 70 IQ, as a minimum for placement in ungraded classes for mental defectives." On the other hand, many articles on definitions, criteria of mental deficiency, and standards for admission to special classes have stressed the

¹ Bibliography for this chapter begins on page 271

necessity of considering the whole picture of the individual before diagnosis or treatment. An excellent statement was made by Doll (22), giving the historical background of criteria, definitions adopted by the 1930 White House Conference, and deprecating the use of the IQ alone as indicating mental deficiency. He stated the significant criteria as social, mental, developmental, educational, and somatic.

Pilcher (78), Thompson and Edwards (94), Wilcox (104), and Yepsen (107) presented evidence that each child is an individual, that there are wide variations within the group classed as deviates, and that expert help is needed by the teacher where children are thought to be mentally deficient. McGehee (65) showed the need of expert help in an analysis of 7,986 elementary-school children from 455 schools when he found that teachers were influenced by personality characteristics and academic achievement in judging mental retardation. Twenty-four percent of those designated as extremely retarded by teachers had IQ's above 90.

Use of the Binet Scale—The Stanford-Binet Scale has been extensively used as one means of identification of mental level, often as the only means. The Terman-Merrill Revision of the Stanford-Binet Scale has been used since its publication in 1937 to replace or supplement the earlier Stanford-Binet. The authors stated (93:51) that the old scale "yields mental ages slightly too high at the younger ages and somewhat too low at the older levels." Research has been published by Merrill (68), Hildreth (38), and Davis (18), comparing mental ages and IQ's on the new and the old scales. Rheingold and Perce (83:110, 115, 116) were particularly concerned with discrepancies which might occur around the IQ rating of 70. They reported that there was a "small but definite tendency for Form L IQ to be higher for cases with IQ's from 80-82." This is contrary to the reports from Merrill, who found that IQ's below 90 were lower on the revised scale.

The "constancy" of the IQ—The controversy over the variation of IQ's in the same individual and the publicity given to it have made caution in the use of the IQ most important. The literature has presented instances of IQ's changing from a classification of normality to feeble-mindedness and vice versa. Various points of view concerning the "constancy" or variability of the IQ were given in the Thirty-Ninth Yearbook of the National Society for the Study of Education (72). Critical reviews of the research were presented by McNemar (66), Thorndike (95), and by Wellman, Skeels, and Skodak (102). Wallin (98) tested two sisters semiannually from the ages of three to sixteen and seventeen, respectively. The results yielded fluctuations in IQ ratings and gave emphasis to the fact that the IQ is only one factor in mental diagnosis. Certain studies have suggested that a low IQ on an early examination may be due to various causal factors. Strauss (89) has discussed exogenous and endogenous types of mental deficiency distinguished by causation. Strauss and Kephart (90:142) studied changes in IQ in the constant environment of the institution, analyzing them according to type. Studying unclassified groups and a group classified according to type, they stated: "It seems possible that much of the confusion in results

among previous studies of the variability in IQ may be due to unrecognized factors in the selection of the groups which change the proportion among these types from group to group."

Social maturity as a criterion—Doll's annotated bibliography (19) listed sixty-six published and unpublished reports of the use of the Vineland Social Maturity Scale as the criterion for identification of the mentally deficient. Bradway (12) in a study of three hundred individuals found this scale a means of discriminating between the feeble-minded who by definition lack social competence and the intellectual subnormal whose mental retardation is not accompanied by social incompetence. Doll and McKay (23) studied the relative social superiority of special class children compared with institutional children of the same sex, chronological age, and mental age.

Nonverbal Abilities in Identifying the Mentally Handicapped

Several studies in the field of nonverbal tests have been made to try to discover in those individuals who are mentally handicapped some abilities which are less dependent upon the comprehension and use of language. Bijou (9) indicated the necessity of giving at least one performance and one verbal test in determining feeble-mindedness.

Performance tests—Mitrano (69) tested 57 feeble-minded subjects with the Witmer formboard and the Stanford-Binet Scale. He found that scores on the Witmer test, when first administered, tended to be higher than scores on the Binet Scale, and to be progressively higher upon readministration. Werner and Strauss (103) gave a battery of tests in the differentiation of the fingers. They found that children with arithmetic disability revealed a specific disturbance in performing these tests. They concluded that functional analysis rather than achievement tests should serve as a guide for remedial work. Abel (2) found that those girls showing a performance on Goodenough Drawing, Knox Cubes, Pintner Non-Language, and designs from the Army Performance Scale which was higher than their performance on tests requiring language skill were successful in hand sewing and garment operating. In another study, Hamlin and Abel (32) gave seventeen tests of intelligence to a group of twenty girls successful in weaving and a group of ten who were not successful. The only tests differentiating the successful weavers were the Seguin, Ferguson, Knox Cubes, and Healy A.

Mechanical ability tests—The constructive ability of 150 subnormal children was tested by McElwee (64) through the use of a jigsaw puzzle. Ability was found to increase with chronological age in children of the same mental levels. Frandsen (29) studied mechanical ability in one hundred moron boys who were given the Minnesota Mechanical Assembly Test. The mean percentile score of 16 indicated the mechanical inferiority of the group. However, the distribution, overlapping that of the normal population, indicated that certain mentally handicapped individuals might well be trained to capitalize their mechanical ability. Pritchard (81) tested seventy-nine boys with chronological ages of twelve years and one month

to eighteen years, mental ages from 8-2 to 14-3. She found that the correlations between mechanical tests and IQ and mental age were very slight. She recommended that training in other fields be given to those not having mechanical intelligence and that those of inferior abstract intelligence having mechanical ability should be discovered and given special training.

Drawing tests—Abel and Sill (3) administered to more than four hundred children and adolescents, one a group of normal children (IQ 80-130) and the other a group of subnormal intelligence (IQ 50-79), a test in which they were told to divide a four-inch square on paper into squares. There were qualitative and quantitative differences between the two groups and there was some overlapping in their performances. Spoerl (86) found a marked tendency for children in special classes to draw above the level to be expected from the mental ages. She also found scores on the Goodenough Scale higher than those made by normal children of like mental ages. Other reports on the results of the Goodenough Scale agreed with this finding.

Provisions for Special Education

City school systems—The latest printed summary of statistics from the United States Office of Education (27.10) was for the school year 1935-1936. Six hundred and forty-three cities in 43 states reported an enrolment of 99,621 mentally deficient pupils in special classes. Although this was the largest number ever reported, a conservative estimate of the number needing special provisions was 500,000. There were 4,871 teachers of special classes in eighty-one cities. In addition to this report, there have been several excellent statements of the development of special classes, the number of children cared for, and the program of special education offered by specific cities and states, such as Richmond (10), Minneapolis (13), New York City (41, 101), and New York State (74). These reports indicated that special education has moved steadily forward, even during depression years.

The elementary years—There have been some statements of objection to the segregation of mentally defective children in special schools and classes (24). Administrators in general education and in the field of special education have responded to these objections by stating the reasons why special classes seem necessary (8, 63). The kind of organization described in many cities provides for making the special class an integral part of the school. There has been marked development away from the single special class where children with wide range in ages and in degrees of retardation are placed. The organization of primary, intermediate, and advanced groups in several cities has been described (6, 8, 30, 34).

The secondary years—There have been many descriptions of provisions for admitting mentally retarded children to the junior or senior high school at the ages of thirteen or fourteen (10, 13, 70, 97, 101). In most instances the program was so organized that the pupils had academic work

part of the day with an especially trained teacher. Other classes and activities, such as handwork and physical education, were planned with regular teachers. Central schools or special classes for the older mentally deficient children were reported by some (6, 105).

Rural areas—Amoss described a survey of rural areas and provisions made wherever exceptionally backward children were found (4). Layman (54) compared the effectiveness of rural and graded school systems in meeting the needs of mentally retarded children. She studied 510 children (IQ 50-79), 360 in small-town graded schools and 150 in one-room rural schools, and compared them on the basis of social and economic status, problems presented, general adjustment, and educational achievement. The social and economic status of both groups was low. The rural children made better social and educational adjustments than the town children. They were more readily accepted as members of their social group. Their oral reading and arithmetic computation scores reached or exceeded their mental ages to a greater extent.

Residential schools—Every state, except Arizona, Arkansas, and Nevada, has at least one public residential institution for the mentally deficient. An enrolment of 21,889 pupils doing schoolwork in 130 schools was reported by Martens (62). The school program, experience units, creative expression, physical education and recreation, psychological service and research, occupational experiences, and relationship to the state educational program were among the topics considered in Martens' report. She indicated that a close relationship between these schools and the day schools needs to be developed. The needs for research were enumerated.

Foster-home placement—Less than 90 percent of all the feeble-minded ever receive institutional care (21). There is not room for them in existing institutions and many remain in the community where they live in a natural and congenial environment at less cost to the community, if adequate supervision is provided. The features of foster-home care, the social status of foster families, and evidence of the success of the plan were presented by Doll (20, 21), Kuenzel (50), and Pollock (79). The implications of this practice for public-school training must be considered if it is adopted on a wide scale. A study of 1,000 cases of feeble-minded children at Letchworth Village (42) raised the question as to whether the community was taking all the responsibility it should or whether the state and community welfare agencies could cooperate for better methods of social control.

Low-grade children—In New York City, in 1937-1938, thirty-two classes enrolled 550 pupils with IQ's below 50. There were four hundred on the waiting lists and 136 who were examined and found ineligible for any school placement (41, 101). Newland (75) studied the records of the first three hundred cases excluded from day school by authority of the state department of public instruction in Pennsylvania. There were 51 cases for whom no mental ages could be determined. The median mental ages of the remaining 249 were 4-10 on the Terman-Merrill Revision and 4-3 on

the Stanford Revision of the Binet Scale. The median IQ was 41. The ratio of boys to girls was 3.2. Wallin (98), from his experience with differences in children, urged that the IQ should not be overemphasized, that all children should have a trial in school before exclusion on the basis of a low IQ, and also before being placed in a residential school. An article by Johnstone (43) called attention to the possibility of training the latent abilities of the low-grade mentally defective. In Massachusetts (76) home training lessons have been planned for children with mental ages under two, from two to four years, and from four to six years, who have been refused admission to school or excluded. Fifty-five children were reported as receiving this home training from parents or social workers. The working materials have been supplied. Better adjustment at home and in the neighborhood, better understanding on the part of the parent, and in some cases postponement of placement in institutions has resulted.

Curriculum Adjustment

Descriptive studies—Certain studies have been made which help the teacher in planning the curriculum for mentally retarded children. The sixth edition of Tredgold's textbook (96) provided general information for understanding the problems of the mentally retarded. Lewis and McGehee (56) made a comparison of the interests of 9,000 mentally retarded and mentally superior children. The teachers were asked to check the participation of each pupil on a list of ten extracurriculum activities and to designate the hobbies for each child on a list of twenty-one hobbies. The findings indicated that there was a paucity of interests as well as low mentality to overcome in retarded children. The authors noted that retarded children were handicapped in any learning situation but less so when education emphasized activity and manual phases and minimized academic aspects. Hankins (33) discussed thirty basic principles underlying progressive practice in teaching exceptional children. Hill (39) presented the psychological basis for methods in teaching pupils of different ability levels.

Mental hygiene—Laycock (53) stated the mental hygiene needs of exceptional children and pointed out that they were similar to those of other children. Farson (26) and Kephart (48) described methods found useful in helping to develop self-reliance and self-respect. Tallman (92) discussed problems of maladjustment and the values of the conference method in making plans to meet these problems.

Activity program—Most recent references to the organization of the curriculum in special education were made by Heck (34), Garrison (30), Frampton (28), and by the state department of public instruction in Pennsylvania (77). All these references have shown the present point of view in education, that the child's school life should be an integrated purposive experience related to his needs and interests. Many articles, such as those by Beaman (7) and Grave (31), described the advantages of an activity program, the development of good work habits, desirable charac-

ter traits, and the opportunities for satisfaction, happiness, and success, with resulting better social adjustment. Scheck (84) reported an informal inquiry sent to one hundred teachers of mentally defective boys in residential schools. The questions were answered by 58 teachers from twenty schools; 6 used activity teaching entirely, 16 usually, 31 occasionally, 5 never. Mahoney and Harshman (59) compared two groups studying transportation. All the objective evidence indicated the positive value of using sound films as a means of instruction. A noticeable improvement in interest, attendance, and ability in self-expression resulted.

Teaching reading—Much work has been done in teaching reading to slow children. Kirk (49) described and applied research in reading. Hegge (37) also reported extensive work in this field and urged a prolonged prereading program. Stock (87) called attention to the fact that the length of time one must wait for reading readiness in mentally handicapped children makes the finding of suitable activities for development difficult. Melchel (67) analyzed a prolonged pre-academic program for fifty-eight children in an institution. The study showed that the children chiefly lacked knowledge of their environment. They improved during training but did not reach a level expected for first-grade work until they had reached a mental age of eight. Coleman (14) and Sears (85) emphasized the necessity for diagnosis. Kirk (49), Potter (80), and Walsh (100) urged the use of children's interests and suitable reading materials. In nearly all studies the emotional problems and the discouragement involved in poor reading were emphasized, together with the necessity for building up self-confidence and providing for success. The reports of MacIntyre (58), Ewerhardt (25), and Strang (88) may be cited as examples of such conclusions.

Progress of Pupils

Nemzek and Meixner (73) studied the grade levels on the Stanford Achievement Test of 326 subnormal pupils in Detroit special classes over a period of four years. The yearly gain on the dictation test was approximately one-third of a grade, and in reading, roughly two-fifths of a grade. The yearly changes in arithmetic were very irregular. The average yearly change for the three subjects was two-fifths of a grade. Bradway (11) found that the mean ages of 53 mentally retarded pupils on sections of the Stanford Achievement Tests equaled or exceeded by one or two years their mean mental ages. Twenty-five public-school pupils in the fourth grade showed similar tendencies. During training periods at the Devereux School, twenty-five mentally retarded subjects made an average of approximately one-half year's improvement per year in spelling, reading comprehension, and arithmetic reasoning, while there was approximately two-thirds of a year's improvement per year in word meaning and arithmetic computation.

Evaluation—Evaluation of the results of curriculum adjustment in special education is much desired and fraught with difficulties. Previous issues of the REVIEW (35, 55) have discussed studies of the comparison

of special-class children matched with similar children in the regular grades, by Bennett, Wassman, Pertsch, and Engel Pertsch used the Modern Achievement Tests, Maller Character Sketches, and Detroit Tests of Mechanical Ability as means of evaluation. He concluded that the academic achievement of the nonsegregated group was somewhat superior; that the unsegregated boys and the special-class girls made greater gains in mechanical ability and personality traits Cowen (17.27) made the following analysis of the Pertsch thesis: (a) the retesting took place after a five months' interval, and the IQ's of the pupils led to an expectation of only $2\frac{1}{2}$ to $3\frac{3}{4}$ months gain in that period, (b) the matching was necessarily bad, because the pupils in special classes had been so placed because of their poorer adjustment; (c) Pertsch interpreted his findings to indicate relatively greater progress on the part of the graded group in reading and arithmetic computation. Cowen, therefore, calculated the percent of mean gain in test scores from the initial to the final testing on the achievement tests. The results showed larger percents of gain in mean score for the special-class group in reading comprehension, reading speed, and arithmetic problems "Thus, it is possible to use Pertsch's own data to reverse his findings." Cowen concluded that the material presented by Pertsch was not adequate evidence for or against the special class.

Occupational Preparation and Placement

School provisions—Martens' report (60) of inquiries sent to sixty cities to determine progressive trends in occupational preparation was the main contribution in this field. There were forty-three replies, indicating provisions for 29,811 adolescents in special schools or classes. Forty-eight percent from twenty-nine cities were located in elementary schools; 13 percent from eleven cities in regular junior high schools, 3 percent from eight cities in regular high schools, 10 percent from eleven cities in special schools for pupils of high-school age only, 20 percent from seventeen cities in special schools for pupils of both elementary- and high-school age; and 6 percent were unclassified. Jones (44) described occupational adjustment for mentally deficient boys in Chicago. The records of each child were studied and he was given the Porteus Maze, Ferguson, Kohs Block, Otis Mental, and National Intelligence tests in an attempt to discover special abilities. Several hundred projects in the shops were available for discovery of capacities and for training. The occupational program in an institution for the high-grade mentally defective child was described by Sullivan (91).

Follow-up studies—A bibliography of follow-up studies was given in "Meeting the Needs of the Mentally Retarded," issued by the Pennsylvania State Department of Public Instruction (77). Most of these studies, except the ones on measurement of social competence, were published before 1935. Martens (60) found little being done in placement or follow-up. Only five of the forty-three cities reported in her study of occupational preparation gave follow-up services. Woods (106) quoted a study showing

that numbers of women with mental ages of eight and nine were supporting themselves, and sometimes their families, at power-machine work. Abel (1) made a study of eighty-four girls selected at random from a large group in adjustment classes for girls between fifteen and sixteen unable to complete elementary school. Many of these girls were subnormal. Fifty-five percent of the group studied were capable of successful and steady employment in industry. A composite list of factories and occupations employing subnormal persons was prepared by Cowen (16). Murphy (71) reported a study of ten children having IQ's of 64-87 when examined from five to fifteen years earlier. Seven were living with their parents, three were wards of social agencies; two boys were working, a third had worked a year previously, two were socially ineffective, two girls were married, another was irregularly employed but self-sufficient, one helped around the house, and one was in an institution. Keator (47) reported a commission in Hartford supervising special-class children after they left school at sixteen years of age. During the month of January 1936, sixty-one mentally inferior youths earned \$2,442 70. This was the month in which the largest amount was reported. From the year ending April 1, 1936, an unspecified number earned \$16,279.73. Housework and farming did not appeal to the youths; they were seeking jobs in factory, store, and laundry. Rural communities and small towns were fairly hospitable to the special-class graduates but the large centers of population were discouraging, if not actually hostile.

An outstanding follow-up study was made by Baller (5). He compared 206 individuals who were in special classes in Lincoln, Nebraska, nine years previously, with 200 others, matched for age and sex, but with IQ's of 100-120 on a group intelligence test. His results agreed with those of other investigators in finding the records of previous special-class pupils better than the prognosis indicated. Twenty-seven percent were wholly, and 57 percent partially, self-supporting. Sixty-one percent were unable to remain steadily employed. Their employment was mainly manual labor with frequent change of jobs. The depression had a greater effect upon their employment than upon that of the normal individual. Antisocial conduct in the subnormal group was more frequent but was not out of proportion to the environment. Sixty-eight percent of those who were not in institutions for the feeble-minded were law-abiding, while fully half of those with records of violation of the law had no additional record. The special class group was economically, socially, and vocationally inferior. They moved more frequently but in a more restricted area; their homes were economically and socially poorer, the death-rate was seven times as great as for normal groups, the marriage rate was lower but the divorce rates about the same. There were two statistically significant differences—subnormal persons had larger families and subnormal women married at a much younger age. Personal appearance and training along homemaking lines seemed to correlate highest with good social adjustment in women. In men, the factors related to success were intelligence and number of years in school.

The Training of Teachers

In a survey of opportunities for preparation of teachers, Martens (61) showed that thirty-six institutions offered teacher-education for mentally handicapped children. New York and Pennsylvania were the two states having the largest number of schools offering such courses. A detailed description of the offerings by states and institutions was given. The training required of special-class teachers in Michigan was outlined (46) and a description was given of the new Horace H. Rackham School of Special Education, which is a part of the Michigan State Normal College in Ypsilanti and is housed in a building erected especially for the training of teachers of handicapped children (45). Wallin (99) and Lloyd-Jones (57) discussed problems and trends in teacher training, and Laycock (52) enumerated the mental health qualifications for special-class teachers.

Summary of Research in the Field

The history of this period of rapidly changing concepts and practices has been well recorded in the research studies of the past five or ten years. The United States Office of Education has made valuable contributions relating to developments throughout the nation. The Terman-Merrill Revision of the Stanford-Binet Scale and the Vineland Social Maturity Scale have provided added technics for the study and identification of mentally handicapped children. Several studies have indicated that many mentally handicapped children show good performance on nonverbal tests. Newland's study of children excluded from school and the provisions made for home training of children in Massachusetts point the way to further investigation and provisions for low-grade cases. Good work has been done in studying methods of teaching reading to mentally handicapped children. The publication of Kirk's book made much research available in this field. Experience units with their results in changed attitudes and increased achievement have been described. The experiment in the use of sound films is one of the best examples of this type. The follow-up studies which have been made, such as Baller's comparison of special class graduates and normal individuals, have much value.

Needs for Further Research

The most vital need is agreement upon classifications and definitions of terms. Existing classifications and definitions should be accepted or better ones evolved for professional use. Until some uniform nomenclature is evolved, individual research projects cannot be used to gather a more accurate body of facts. Recent experiments in the variability of IQ's throw into strong focus the need for research in the retesting of individuals by well-trained personnel. Better case-study technics and more adequate basis for early discovery of mentally handicapped children are other avenues of approach that should be followed. There is room for study of characteristics of mentally handicapped children, their limitations and potentialities, and the evolution of the best curriculums for their development.

The problems of segregation need objective study. Adequate technics of evaluation are yet to be developed and great care should be used in comparisons that are made between special-class and nonspecial-class children. If an adequate job of training mentally handicapped children is to be done, many more trained teachers are needed. Experiments with nonverbal tests indicate that the teachers need good training in ways of discovering special abilities and planning for maximum development where such abilities are found. The whole field of adequate training for adolescents on the secondary-school level is a pertinent subject for research. Throughout the country, mentally handicapped youth are being sent to junior and senior high schools. Thus far there is no compilation of data for any large number of communities showing numbers of pupils so placed, the types of organization and curriculums used, and the effect upon the pupils. The literature in this field is difficult to interpret because of the extent to which similar provisions are made for dull-normal pupils.

Many more follow-up studies made under changing economic and social conditions are sorely needed to throw light on the organization and methods of education, the type of supervision or care needed in adult life, the kind of occupations currently available, and the preparation needed for them. To define other areas of research needed in this field would be to enumerate each of the headings under which research was reported and to add others, such as causation and prevention. A common vocabulary and a definite organization of research activities might show considerable result in the understanding of mentally handicapped children and the evolution of better educational procedures to meet their needs.

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CHAPTER III

The Mentally Gifted¹

T. ERNEST NEWLAND

THE PERIOD COVERED IN THIS CHAPTER has been made somewhat greater chronologically than is customary in the REVIEW because there were some earlier studies deserving mention that were not cited in the December 1936 issue of the REVIEW, which contained a brief reference to intellectually superior students. All the studies covered in this chapter however have been published since January 1930. The term "mentally gifted" has intentionally been interpreted broadly. Too great a restriction in the field would result in the overlooking of much worthwhile work that has been done on children of general scholastic superiority.

Identification and Description of Superior Children

Most of the literature dealing with the IQ controversy has been omitted from this review on the assumption that that material more properly belongs in those issues of the REVIEW pertaining to mental testing. Certain studies seem, however, to be directly relevant. Carroll and Hollingworth (8) pointed out the presence of a systematic error in Herring-Binet results on gifted children that would not warrant the use of such results as alternates of the Stanford-Binet. Lincoln (44) found that Cornell-Coxe performance quotients averaged higher than did Binet IQ's on superior children having Binet IQ's of 110 and up. MacMurray (47) compared Stanford-Binet with Pintner-Patterson results on gifted and dull-normal children. Nemzek (60) studied the constancy of the IQ's of a superior group, found a greater variability than in an unselected population, and found the retest results to average higher than original results, suggesting practice effects over the one-year intervals. Cattell (9) endeavored to ascertain the reasons for the differences between test-retest results in the Harvard Growth Study and some Stanford cases, suggesting the possibility of the method of selection of the cases used. Lincoln (42, 43) found retest Stanford-Binet IQ's lower than earlier results, although the decrease was not great.

That the gifted child can be identified on the basis of certain behavior signs and trends as well as by the results of the usual standardized tests was suggested by Hildreth (26), as a result of her study of fifty superior (median IQ, 136) young (median CA, 5.5) children in a private school paired with fifty average (median IQ, 103) children. Witty (84) pointed out that judgment as to superiority should not be based solely upon the intelligence quotient. On the basis of 27,642 cases group-tested at the secondary level (87) he found an equal number of superior boys and

¹ Bibliography for this chapter begins on page 283

girls, as contrasted with the ratio of two boys to each girl reported by Terman and Burks. He also reported on the play activities of gifted children (86). On the basis of a study of twenty boys and twenty girls having an average chronological age of seventeen years and six months and a mean IQ of 152, he found essentially the same characteristics as other investigators had reported, with the possible exception of the fact that his cases showed comparatively little interest in books dealing with the fine arts, music, and drama (90).

Hollingworth (28), characterizing stature by means of a ratio between the child's stature and that of appropriate norms for race, sex, and age, found, in the case of forty-seven children having Binet IQ's of 135 or above, and having at the start of the six-year study chronological ages between seven and nine years, that the children ran consistently 5 percent taller as a group. She also found a mixed group of adolescents (median IQ, 152) to be judged highly attractive by adults (27).

Case and Small-Group Intensive Studies

Fortunately, not all studies of gifted or superior children have been made in terms of averages. Illustrative case studies, since Terman's 1926 volume, are those by Elwood (16), Goldberg (21), McElwee (50), Rockwell (67), and Warner (76). Witty's 1930 study of 100 gifted children (88) was followed by a number of unpublished theses and dissertations based upon from 33 to 95 cases. Typical of these are the ones by Beck (3), Mayer (49), who paid particular attention to parental attitudes, Parsons (63), Reed (64), and Wetherbee (78). Simmons (69) studied the behavior of high IQ children in situations involving suggestion, and Coy (11) made an analysis of the reports of the daily programs of 30 nine-, ten-, and eleven-year-olds who were doing seventh-grade work in a special class.

Follow-Up Studies

The later performance of children considered to be superior or gifted appears to be consistently above-average accomplishment, although there is some evidence of regression. Hall (24) made a follow-up study after ten years on 120 children. Hollingworth and Kaunitz (29) found that, of the original group of 116 children who were above the top percentile point, 82 percent remained there after ten years. Witty's (85) ten-year follow-up of a group of 50 children with a median IQ of 153, showed sustained superiority in physical condition, and in school and home adjustment in spite of inadequate school stimulation for them, and a "versatility and vitality of interest" Terman and Oden's reports (72, 73) of the status of the original California gifted group sixteen years later, further corroborate the generalization. Educational implications of such long-time studies were pointed out by Terman (71). Lorge and Hollingworth (45) reported that high performance on adult-level tests were predictable

on the basis of high Binet IQ's, and suggested that special superiority (genius?) appeared to be predictable in those cases having Binet IQ's above 180. Rigg (66) endeavored to make a follow-up study of sixteen superior students, as shown by their performances on the National Intelligence Test and the Terman Group Test, but charged the inadequacy of his study to the mobility of our urban civilization.

Contrast Studies

Consistent with other lines of evidence concerning the ways in which superior children compare with dull children in generalization, amount and quality of work, Wilson (82, 83) reported on the basis of laboratory situations that the superior nine- and twelve-year-olds were more adept in applying a principle, were more accurate, and turned out more work even though they did make the same kinds of errors made by their dull equatees. The results of Carroll's study (7) on generalization in learning spelling agreed as far as the observation concerning generalization was concerned, but there were interesting differences in the 34,000 spelling errors made by the 100 bright and 100 dull children. Lazar (39), on the basis of her study of some 2000 ten-, eleven-, and twelve-year-old boys and girls in thirteen public schools in New York City, some 30 percent of whom were above 110 in IQ and a comparable percent below 90, reported essentially the same as has been reported by Terman, Witty, and others concerning the reading interests, activities, and opportunities of superior children.

Davidson (13) studied the outcomes of a four-and-one-half-month reading training program on a small group of three-, four-, and five-year-old children, each of whom had a mental age of four at the beginning of the study, and found a great superiority of the bright group in vocabulary, in speech, in eye movements, and in performance on the Pressey first-grade attainment scale. There was reported, however, an inverse relationship between gains in reading and in Binet IQ's. An interesting conclusion was drawn by Hutt (32) to the effect that pupils of the same mental age, whether bright or dull, tended to achieve equally in most school subjects, although discrepancies were found. Huber (31) concluded from his study of cases from the files of a college educational clinic that when each age level (ten, eleven, and fourteen) is taken separately, and the average, bright, and dull (Binet IQ groups of 96-105, 116-125, and 76-85, respectively) are compared with reference to each ability (Stanford Achievement Test performance in reading and arithmetic, auditory rote memory, and vocabulary on both the Stanford and Binet), no consistency was found as to which of the three IQ classifications was most variable. On a composite basis, however, the bright group showed a decided decrease in variability in performance as the chronological age increased. Blair (5, 6) reported a study of mentally superior and inferior children in junior and senior high-school situations. Superior boys and girls were found to prefer mathematics and English

respectively, while shop and home economics were preferred respectively by the slower boys and girls.

Educational Achievement of Superior Children

Studies of the educational performances of superior children have ranged from the very general to intensive study in particular subject-matter areas. Regensburg (65) has reported on the educational success and failure of the superior, Lewis (41) made a study that was confined to the elementary level; and McGovney (52) investigated intensively the matter of spelling deficiency in mentally superior children. Miles (54) analyzed the achievements of a superior group of students in a four-year high school, while Lepowsky (40) went intensively into the improvement of superior pupils in first-term algebra. Bacon (2) compared the study habits of excellent and deficient high-school pupils and found that the superiority of the better group was not as marked as expected. An intensive study was made by Miller (55) of the college success of high-school graduates of exceptional ability. Those interested in the relationship between high school and college can profitably consider Jones' studies (34) of certain of these problems among superior students.

Extent and Types of Educational Provisions

According to the report of a New York state commission (68) not more than .3 percent of the gifted children of that state were provided for in the public schools. While the significance of this observation rests on the interpretation of what constitutes a provision for gifted children, the general import of the statement should give rise to serious thought. Two reports, by Lovett (46) and by the National Committee on Coordination in Secondary Education (59), have been made on the provisions for superior children at the secondary level. Bell (4) made a similar study at the elementary level in the state of New York, McKie (53), at the high-school level in southwestern Iowa; Odell (62), at both levels in Illinois; and Kramer (35) studied such practices in selected cities throughout the United States. Hall (23) developed a score sheet which might be used in rating a school's provisions for superior children. His four major categories of items on which ratings could be made were (a) the grades in which provisions were made, (b) the methods used in selecting the bright children, (c) factors affecting the organization—classes, teachers, equipment, and so forth, and (d) the extent to which and ways in which the curriculum was modified.

Acceleration—One type of educational adjustment made for mentally superior pupils has been that of acceleration. This may or may not include grade-skipping. Witty and Wilkins (91) reviewed the research and non-research literature pertaining to this administrative device and recommended its use. Moeser (57) wrote a master's thesis on 100 accelerated pupils in junior high school. The findings of Crowder (12), Engle (17, 18, 19), Herr (25), Lamson (37), Moore (58), Wester (77), and Wilkins

(79, 80, 81) support the generalization that moderate acceleration did not appear to be followed by poor educational adjustment at the secondary level. Engle found that the "double-promotion" group at the elementary level made higher salaries and belonged to more organizations as adults than did the slower groups. He pointed out that the accelerated group while in high school and college were not quite as active socially as their classmates, but he found that when comparisons were made on a chronological age basis, the contrasts practically disappeared. This is in partial agreement with certain of Herr's findings.

Enrichment—Using 170 pairs of pupils, equated for IQ, EQ, and EA, having IQ's of 110 upward and EQ's of 100 upward, and scattered among 38 classes, Dransfield (14) compared the achievements of superior pupils in enriched typical classroom programs with those in nonenriched typical classes. The experimental group showed superior achievement, particularly on the enrichment tests. Dransfield stated that the type of enrichment technique which he studied was administratively feasible in the typical classroom unit.

Special classes—Addicott (1) reported the achievement of a special class of 30 fourth-, fifth-, and sixth-graders having a median Binet IQ of 135. A gain of one year in arithmetic and reading was found to have taken place in a little less than a semester. Gray and Hollingworth (22) compared the Stanford Achievement Test results of a group of 56 special-class superior children with those of 36 regular-class superior children, all of whom had Binet IQ's of 130 or more. When tested after three years' experimentation, the achievement of the special-class group was superior regardless of the fact of segregation. Gates and Bond (20) reported on certain instructional outcomes of the Speyer School program. The superiority of an experimental, special-class, superior group (Binet IQ of 135 and above) over a paired control group, not only in academic achievement but also in school leadership, was reported by Lamson (36). In this study, the gifted were found to maintain their superiority throughout their high-school course.

Social and Emotional Adjustments

Studies of social and emotional adjustments have been made by Laycock (38), who contrasted the adjustments of superior and inferior school children; by Hollingworth and Rust (30), who administered the Bernreuter Personality Inventory to a group of superior adolescents, and by Thorndike (75), who administered the Pressey Interest-Attitude Test to 49 of the Speyer School gifted boys and girls. General superiority of the gifted was borne out, Thorndike finding that the Pressey scores corresponded more nearly to the children's mental ages than to their chronological ages. Clinical studies, both of a survey and of an intensive nature, were reported by Mateer (48), Neville (61), and Smith (70). An intensive study of the personality maladjustments of two mentally superior cases was made by Edwards (15). Miller (56) found greater social activity among superior

college students, as measured by membership and office holdings. Wilkins (81), on the basis of his study of 282 accelerated pupils ranging in chronological age from 15-5 to 16-11 and in mental age from 16-1 to 19-6, observed that the dangers attributed to acceleration were largely overestimated, as shown by the pupils' (a) scholastic interests, (b) vocational choices, and (c) participation in activities, as reported by the children and by their parents. The relationship of family and parental factors to the adjustments of superior pupils was studied by Conklin (10) and by McGehee and Lewis (51), the latter finding the attitudes on the part of parents of superior children superior to the attitudes on the part of parents of average, dull, and retarded children.

Studies of Superior Negro Children

Witty and Jenkins (89) reported the educational achievement of 26 elementary-school Negro children in Grades III to VIII. These children, having Binet IQ's of 140 and up, were found to be achieving, on the basis of Stanford Achievement Test results, on the average of 1.4 grades above their placements, and 3.3 grades above their chronological ages. The highest average educational quotients were in language usage, 147, and reading, 144, while the lowest average was in arithmetic, 127. Terwilliger (74) found twelve cases with IQ's above 125 in a total population of 7,552. The usual picture of general superiority to the rest of the group was reported. Jenkins (33), using as his criterion of mental superiority a Binet IQ of 120 and up, reported 103 cases out of 8,145 tested. The ratio of girls to boys was 233 to 100. Seventy-three percent of the superior group were Chicago-born. Other data on the nature of the superior group indicated general superiority.

Needed Research on Gifted Children

The increase during the past decade in the number of research studies in this field is most encouraging. Studies concerning this type of exceptional children have, like the bulk of those dealing with other types of children, utilized many of the devices and technics for evaluation that were most readily at hand, and the authors of the studies have concerned themselves with some of the simpler situations in which the superior children have been found. What has been learned as a result of these studies is, on the whole, manifestly worthwhile.

It is necessary, however, to push further into some of the more unwieldy, but nevertheless important, phases of problems attending the proper education of superior children. If one may judge by the greater failure on the part of the public elementary schools to identify and provide for their mentally superior children early in the elementary grades, as contrasted with the provisions at hand at the secondary level, some most valuable contributions could be made by showing objectively certain of the effects of the neglect of young superior children, particularly as regards the development of personality patterns, habits of creativeness, habits of in-

dustry, and greater social and educational achievement—this latter not to be conceived as narrowly as simple test abilities. It is possible that there are already in operation many valuable enrichment technics that could be applied more generally, once they have been objectively identified and evaluated. Such identification and evaluation are in themselves major problems of research, and may not easily lend themselves to solution by the determination of means, standard deviations, or critical ratios.

Another area of needed research is the determination and specific characterization of goals of social conduct and responsibility which should dominate the educational programs of superior children to a greater degree than for any other group. Such goals would include, for example, technics of taking responsibility in groups, technics of manipulating groups, technics of getting information (which we are beginning to recognize), and technics of keeping ever sensitive to the fact of group membership. Complementary to such research would be the development and evaluation of technics which would assist the group to work to greatest advantage with its leaders. Such studies should bring much more prominently into the picture the parts played by frequently overlooked attitudes and personality patterns.

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CHAPTER IV

The Socially Maladjusted¹

J. HAROLD WILLIAMS

THE SCOPE OF THE TOPIC for this chapter necessarily overlaps that of the chapter prepared by Bennett (6) for the December 1940 issue of the REVIEW, on problem children, delinquency, and treatment. The present treatise will therefore be restricted to studies published since 1935 which, with a single exception, are not found in Bennett's presentation. Moreover, this chapter will emphasize findings and procedures which are of special importance in planning for the education of socially maladjusted children in the schools.

General Sources of Literature

In addition to the treatment by Bennett (6) and the sources to which he refers, extensive bibliographies on various aspects of juvenile delinquency were offered by the United States Children's Bureau (72), Menefee and Chambers (48), and the Osborne Association (57). Dobbs (14) analyzed some of the concepts and trends appearing in outstanding literature in this field. Most of the bibliographies deal in part with educational aspects of the problem, especially in connection with the work of residential institutions. Heck (25a) in a general text, *The Education of Exceptional Children*, devoted one part to the education of the socially handicapped child. A fact that should be noted in connection with sources of literature is the discontinuance of the *Journal of Juvenile Research*, with the issue of July-October 1938. This periodical, published by the California Bureau of Juvenile Research, was the successor to the *Journal of Delinquency*, dating from 1916.

Symptoms of Social Maladjustment

Several studies dealing with diagnostic procedures and disclosing characteristic symptoms of social maladjustment in children are of significance for special education. Hildreth (26) constructed a personality and interest inventory applicable to pupils in the elementary schools, designed for use by teachers in interviewing problem children. Meyering (49) analyzed the maladjustment behavior manifestations of boys while camping. Most frequent were (in the younger groups) homesickness and infantile behavior; (in the older groups) tardiness and temper tantrums; (in both groups) indifference, unpopularity, and lying. Thorpe (69) listed some easily observable symptoms of incipient behavior difficulty. Kanner (33) reviewed pupils' problems under the main headings of undesirable habit formations, undesirable relations with others, and unsatisfactory scholastic performance. He warned against applying the rigid categories of mental

¹ Bibliography for this chapter begins on page 294

disease to social maladjustments in children. Hackfield (23) discussed the relationship between neuropathic traits in children and the later development of neuropsychiatric diseases. A summary of case studies by Lippman (40) led to the conclusion that further analysis would reveal a stronger component of neurosis in delinquency than had been suspected.

Good (21) discussed the available information concerning the extent of maladjustment among children and presented an outline of thirteen areas for study in providing appropriate remedial treatment and instruction. A psychobiologic interpretation of juvenile delinquency was undertaken by Michaels (50), with the conclusion that "there is probably a special kind of psychosomatic disposition which permeates the delinquent individual, giving rise to specific individuations at the biological and psychological levels," and that "the delinquent, with his unique configuration, probably reacts as differently from either the neurotic and the psychotic as they react differently from each other."

Physical Factors and Adjustment

Inskeep (29) summarized investigations dealing with physical factors related to personality maladjustment. Defects of hearing in relation to behavior problems were investigated by Molitch and Adams (54). Turner (70) found significant differences in eye, hand, and foot preferences of emotionally unstable adolescents and a control group of emotionally stable children. Endocrine disturbances in relation to social maladjustment in children were studied by Lurie (43), and Witty and Schacter (78). Molitch (53) found a slightly higher incidence of truancy among the endocrine cases in an institution group of boys than in those who were not so affected. Rosanoff, Handy, and Plesset (62), in an exhaustive study of twins, obtained evidence that both heredity and cerebral birth trauma play important parts in the causation of behavior disorders, and that the greater susceptibility of males to birth trauma accounts for the more frequent occurrence of delinquency in boys.

Mental Factors in Adjustment

The intelligence of institutionalized delinquent children was reviewed by Owen (58), who made a statistical summary of forty-three studies in this field. Mann and Mann (45) analyzed the results of Stanford-Binet retests of 428 juvenile delinquents, at intervals varying up to ten years, using Form L of the new revision. The mean change was but one IQ point for the total group, with individual differences ranging from zero to 30 points. This relative constancy was considered especially significant in view of the variety of treatment procedures to which members of the group had been subjected during the intervening period of five to ten years. In a delinquency area surveyed by Lichtenstein and Brown (39) the children were found to be fairly well placed in school according to chronological age, but were advanced beyond their mental ages. A downward trend in IQ occurred in successive age groups. In a group of behavior traits observed among boys in a camping situation, Meyering

(49) found indifference, lying, and sex behavior to be inversely related to intelligence. Michaels and Schilling (51) rated childrens' antisocial acts in order of seriousness and found no significant correlation between these and either mental age or IQ. Certain differences between delinquent and nondelinquent boys in superstitious beliefs were reported by Ter Keurst (68a). In a study by Hirsch (27), the interests of 600 maladjusted boys were found to be unrelated to their measured mental abilities but slightly related to their self-estimated abilities.

Social and Economic Factors in Adjustment

Studies continue to emphasize the relationship of home and community conditions to social maladjustment in children, and these are often of immediate concern to the school. Longmoor and Young (41) made a cartographic analysis of data in Long Beach, California, plotting cases of juvenile delinquency, public relief, and mobility for that urban area. Mobility and delinquency were found to be closely correlated. Smith (65) found a relationship between delinquency rates and distance of homes from urban communities in Kansas. Meyering (49) found that truancy in a camping situation was most prevalent among boys from the best homes, as rated on the Sims scale. Lander (38) developed a classification of "traumatic environment" in delinquent boys including such factors as parental rejection and parental incompatibility. An investigation of runaways by Riemer (60) revealed a symptom complex composed chiefly of three underlying forces: (a) need for love, (b) need for hostile aggression, and (c) need for increased self-esteem. In this psychiatric consideration the runaway displays an extremely negative character, and his behavior constitutes a severe narcissistic disorder.

Attitudes of Teachers

A noteworthy aid to teachers is the condensation of Wickman's findings under a new title (77). His statement that "teachers' reactions to the behavior problems of children are largely determined by the direct effect which the behavior produces in the teachers themselves," has stimulated numerous investigators to test this concept under varying conditions. Uger (71) reviewed the work in this field and cited two outstanding findings: (a) teachers tend to identify the problem child with antagonism to authority and to the teachers' moral concepts; and (b) they tend to ignore the child's purely personal problems, such as shyness, fearfulness, or unhappiness, because these do not often interfere with classroom order. Bott (8) compared the attitudes of parents, teachers, mental hygienists, public health nurses, and social workers toward twenty-one misdemeanors of children. Ten of the traits were ranked similarly by all groups, but on the remaining eleven traits there were differences, those between teachers and mental hygienists being the largest. On the other hand, Ellis and Miller (16) used the Wickman technic with 382 junior and senior high-school teachers in Denver, finding greater agreement between teachers and mental hygienists than Wickman had obtained in 1928.

School Conditions

Applying the Monroe Silent Reading Test to a group of socially maladjusted boys and correlating the scores with various factors led Feinberg and Reed (19) to conclude that many of these boys were meeting continuous defeat in school due to reading difficulties, which led them to look for success in spheres less socially acceptable. Keener (34) presented case studies illustrating the responsibility of the classroom teacher for building attitudes which tend to prevent delinquent behavior. Wallin (74), in his capacity as director of the division of special education for the Delaware State Department of Public Instruction, outlined practical ways in which the school can prevent truancy by providing more satisfying activities for pupils. The special class was especially recommended for the more serious types of behavior problems.

Experience at the Montefiore special school for maladjusted boys, in Chicago, led Stullken (66, 67) to the observation that reading difficulties are often related to behavior problems, and that remedial instruction tends to relieve the two forms of maladjustment simultaneously. Gates (20) presented findings which tend to support this view. Another technic is that of the drama, as described by Davidoff and Buckland (10). Socially normal and delinquent children were compared and the delinquents were found to be relatively deficient in personality integration and creative ability. It was recommended that instruction along these lines be adapted to age levels and to interests which are related to the degree of intellectual and emotional maturity. A survey of special education groups in Ohio was conducted by Berry (7), who included data on behavior problems and recommended increased attention to their needs.

A significant study was made by Evjen (18) with the use of his rating scale, applicable to both school and juvenile court cases, to determine the apparent adjustment of children to school relationships. The scale was found to be valuable for locating behavior disorders, determining their intensity, and indicating the sort of therapeutic and remedial needs. Welch (76) presented case studies of problem girls attending a special high school in Portland, Oregon. She listed as special needs in dealing with such problems better trained teachers, remedial teachings, provisions for segregation of some pupils in special classes, and visiting teachers. The manner in which the New York City schools are being adapted to the varying needs of pupils, with special reference to social maladjustment, was described in detail by a report from that city (56).

Relation of Courts and Institutions

Increasing attention is being given to the relationship of the courts to the schools, and the possibility of adopting similar or integrated procedures. The present status of the juvenile court with reference to the applicability of some of its methods in the school was described by Van Waters (73). Healy (25) summarized the proposed "Youth Correction Authority Act," a model enactment prepared for the American Law Institute and designed to set up

procedure in any state for dealing with matters of probation, institutional treatment, and parole. A significant feature of the measure is that careful study of the offender is required. In a survey report on residential schools for handicapped children Martens (46) included a chapter on provisions for the socially maladjusted. The most comprehensive recent study of institutions for socially maladjusted children was made by the Osborne Association (57). The findings have appeared in three volumes, representing three geographical areas in the United States. Volume 1 deals with the north central states, volume 2 with Kentucky and Tennessee, volume 3 with Washington, Oregon, and California. The survey was designed, according to the introductory statement in volume 3, to evaluate

. . . the plants, personnel, and program which have been set up for the care of boys and girls whose behavior has manifested itself in antisocial ways serious enough to make a period of specialized training and treatment necessary. The reports also point out the steps which, in our judgment, should be taken so that these institutions may function more effectively. Interspersed through the volume will be found statements which the Osborne Association believes constitute a sound and constructive philosophy of institution practice.

The setting up of an experimental institution to meet community needs with reference to child behavior problems was described by Teeter (68). The place of the detention home was discussed by Audy (2) and by Grossman (22), who described the work of the Hawthorne-Cedar Knolls school conducted on the cottage plan by the Jewish Board of Guardians in New York City. Kephart (35) also reported on the success of the cottage plan with self-government. Deacon (11) set forth procedures in effect at the Training School at Vineland, New Jersey, for dealing with behavior problems in association with mental deficiency. Other aspects of institution treatment were presented by Jenkins (31), Lowrey (42), and Eccles (15). Derrick and Fenton (13) showed how the Boy Scout program can be made to function in an institution for delinquents.

Experimental studies, with controls, have brought out the relative effectiveness of certain aspects of institution treatment. Some of these studies, including those of Anderson (1), Brown (9), and Murphy (55), made detailed comparisons of institution and noninstitution children. Deming (12), on the basis of case studies, was convinced that both institution and foster-home placement are necessary and that it would be a mistake to assume that one form should be used exclusively.

Prevention of Social Maladjustment

Preventive methods are still largely in the discussion stage, although some studies show concrete evidence of results. Sloane and Lane (64) presented the case of a delinquent boy who gave up his pattern of antisocial tendencies under the guidance of a welfare worker. Johnson (32) discussed the work of the Chicago public schools in correcting and preventing truancy, largely through segregation in special classes and special schools. Harnon (24) described mental hygiene procedures which might be utilized

by the classroom teacher. Beam (5) listed some of the outstanding ways the schools may cooperate with other agencies in the prevention of delinquency. Efforts of specific communities to establish preventive programs were outlined by Elmot (17), Houloose (28), Robinson (61), and Jacob (30). The diagnostic procedures and staff organization of child guidance clinics were described by Lurie and Hertzman (44), Miller (52), and Weiss (75).

Several writers submitted evidence of the growing relationship of child guidance to previously recognized activities. Kunitz (37) set up a readjustment unit in physical education for dealing with problem high-school pupils. Shaffer (63) pointed out the values of play and recreation as therapeutic measures. Martin (47) presented a plan, based on a two-year experiment, for preventive work through a boys' club.

Statewide and comprehensive community programs are considered by many observers to be the most promising agencies of prevention. Patry (59) outlined a state program of mental hygiene, including its relation to teacher training. Beam (3) described the coordinating councils of California, and in another article (4) reported on a national survey of coordinated types of community programs.

Summary and Needed Research

The reader is again reminded that excellent material relating to problem children and delinquency and its treatment appeared in the December 1940 issue of the *REVIEW*. In this chapter additional material, with particular attention to the educational aspects of the field, has been reviewed.

Much of the literature has referred to procedures and proposals for prevention, without sufficient objective evidence of their value. Too few studies applied directly to the nature and conduct of educational programs, from the viewpoint of either prevention or treatment. A significant beginning, however, has been made in the study of basic physical factors, which may have important educational implications; etiological investigations and endocrine studies seem promising. Behavior rating scales and personality inventories, if standardized and made generally available, may become useful tools of research in discovering maladjustments and in guiding the development of improved educational programs. Diagnostic and adjustment studies related to pupil interest, school success, and behavior should aid in determining improved curriculum content.

The utilization of the child guidance clinic and foster home placement, case-work methods in juvenile courts, and treatment in social groups, such as camps and recreation clubs, has pointed to varied means and procedures to which the school may relate its program and methods. Suggested plans for the cooperation of the school and these other community agencies might well be followed up by controlled experimental studies leading to objective evidence of results. Finally, studies of residential schools for juvenile delinquents have given promise that findings from research may prove increasingly valuable in building constructive programs in these schools.

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CHAPTER V

The Auditorily and the Speech Handicapped¹

(AUTHORSHIP AS INDICATED BY SECTION)

IN THE BRIEF SUMMARIES relating to the handicapped that have appeared in earlier numbers of the REVIEW, major studies of the auditorily handicapped have been reviewed up to about 1938. Literature in the area of education for speech defects has received less attention. The reviewers, in this chapter, have reported material predominantly of the past five years, including earlier studies only for important points of reference.

The first two sections of the chapter deal with the literature concerning the deaf and the hard of hearing; the third section treats of the speech handicapped. Since many of the studies deal with both the deaf and the hard of hearing, these two groups are reported together. Due to the improvement of instruments for measuring hearing loss, contributions have been made within the past five years to methods of making hearing surveys, both in public day schools and in residential schools, and to the use of those findings as a basis for educational treatment. Research in the training of residual hearing and of speech and language through the use of hearing aids has been significant. Studies of vocational adjustment have also been made. Research relating to the psychological aspects of learning ability and personality adjustment has been continued.

A. Educational Provisions for the Deaf and Hard of Hearing

CHRISTINE P. INGRAM

Educational Provisions for the Deaf

Fusfeld (9) presented a tabular statement of information on 68 public residential schools, 128 public day schools, and 9 denominational and private schools, totaling 20,507 pupils and 2,854 instructors, in the United States as of October 20, 1939. Items of enrolment, number of instructors, and vocations were stated for each school. The same items for 10 schools in Canada are included. Taylor (30) presented a series of articles covering the development of public day schools in the United States. He attributed the increase in day schools to parents' interest in oral instruction and the child's living at home.

The report of the Committee on Hard-of-Hearing Children of the American Society for the Hard of Hearing (11) stated that for the school year 1938-39, 17,708 children were reported receiving instruction in lip reading.

¹ Bibliography for this chapter begins on page 310

These figures included 10,000 from New York State, of whom 4,000 were definitely reported and 6,000 estimated by the state department. Lip-reading teachers, numbering 257 in 107 towns of the country, were reported. Thirty-three cities reported 250 hard-of-hearing pupils enrolled in special class units. Although the provision for lip-reading instruction was considerably greater than in earlier reports, large numbers who needed it were still uninstructed in the art. The report suggested that much educational work remained to be done with otologists and school administrators.

The preschool deaf and hard-of-hearing child—Benning (3) stated the importance of nursery-school training for deaf children and gave suggestions for organizing and conducting nursery schools. Howard (15) described a program in the Rochester School for the Deaf based on nursery-school technics for normal children and on technics of the Alcorn method for developing speech. Hoffman (14) dealt with the nursery-school program at the Lexington Avenue School for the Deaf in New York City. Methods for the development of speech and lip reading were described. Cloud (6) reported the nursery-school experiment at the Illinois State School. Timberlake (32) stated problems that arise when the hard of hearing do not have early educational planning which takes account of their handicap. Loew (21) reported a county survey in New York State to discover children of preschool age with impaired hearing. This complete study included recommendations for discovery, registration, treatment, and prevention of hearing loss of preschool children.

Surveys of Training in Residential Schools for the Deaf

Pauls (28) made an analytical study of the hearing loss of 100 children at the New Jersey State School for the Deaf. She found that only 4 percent of the children were totally deaf; that approximately 50 percent heard better by bone conduction than by air conduction; and that approximately 50 percent could be aided by acoustic training and a hearing aid. She concluded that the greatest educational advance for children with defective hearing was in the use of acoustic devices, following scientific study of amount of hearing loss. LaBranche (20) reported an audiometric survey of 124 pupils in the Michigan School for the Deaf. The large majority had a hearing loss of 90 to 100 percent. A high negative correlation was found between hearing loss and school achievement. O'Connor (27) reported a partial follow-up of an extensive and comprehensive survey in 1935 and 1936 of medical and educational phases of testing, medical treatment, and utilization of residual hearing of pupils in schools for the deaf. Comparisons with earlier surveys indicated substantial gains. O'Connor (26) also furnished a clear-cut picture of findings of a hearing survey and resulting diagnosis which furnished a basis for differentiated educational treatment. Four case histories were given. This study was carried on at the Lexington Avenue School for the Deaf.

A study to secure objective data on the results of acoustic training was made by Johnson (17). At the Illinois School for the Deaf, tests of (a) drill vocabulary, (b) speech intelligibility, (c) acoustic understanding, (d) acoustic speech reading, and (e) speech reading were given to deaf and hard-of-hearing children following full-time use of the ear phone in their classes. The conclusion was that the degree of success in speech and lip reading was directly related to the extent to which hearing was trained. Numbers (25) described an experiment in the training of residual hearing through the intensive use of the hearing aid with a small group of children without speech upon entrance to the Clarke School for the Deaf, Northampton, Massachusetts. Her results showed gain in linguistic and speech development. Goldstein (12:18) described the acoustic method for the deaf as it was developed in the Central Institute for the Deaf at St. Louis as the "stimulation or education of the hearing mechanism and its associated sense organs by sound vibration as applied by voice or any sonorous instrument." Graduated practical exercises for developing perception of tones and spoken language were outlined. The administration of hearing tests, diagnosis for educational treatment, and the use of hearing aids were also included. A comprehensive and scientific approach to many problems, including hearing tests and aids, was made by Ewing and Ewing (8), based on study and experience in the Manchester School for the Deaf in England. The problems of all levels from preschool to adult were discussed. Alfaro (1) presented the causes of deafness, and a statement of therapeutic measures of proven value was made by Johnson (16).

Surveys of Conditions in Public Day Schools

Timberlake (31) presented a comprehensive and objective description of the different groupings under the deaf and hard of hearing as to degree of hearing loss and speech, with accompanying recommendations for educational treatment. She made recommendations for carrying out hearing surveys and otological examinations in schools. The American Society for the Hard of Hearing in its report (11) for the school year 1938-39 stated that 1,871,031 school children were given audiometer tests in 767 towns and 126 counties in the nation. This was the largest number yet reported. The average incidence of impaired hearing was calculated from these reports to be 6.9 percent. The figure for the previous year was 6.1 percent. A total of 23,371 were given a follow-up test with the pure tone audiometer. The number who were given otological examinations increased. Gardner (10) furnished data on the extent of hearing defects among 44,232 school children surveyed by the Indiana University Speech and Hearing Clinic in the State of Indiana. Teachers filled out detailed reports of children with 15 decibels loss in the better ear or 30 decibels loss in one ear and normal hearing in the other, and educational treatment was planned accordingly. Gardner also reported that certain communities in as many as forty-five states have a regular plan for annual hearing surveys of school children.

State departments have made rapid progress in passing regulations for hearing and otological surveys. Three states—New York, Massachusetts, and Oklahoma—have appointed an audiometer counselor. New York City submitted a special report (5) on retardation of children with impaired hearing, under the Works Progress Administration Project No. 6065 for the Conservation of Hearing of School Children. Findings of the survey, involving more than 600,000 children, indicated that 3 percent had impaired hearing in both ears; about 45 percent needed otological diagnosis, and 15 to 35 percent needed lip-reading instruction. Experience with more than 4,000 hard-of-hearing children pointed to the reduction of retardation after lip-reading instruction had been received for a period of from six months to two years.

Hearing Aids

Hand in hand with the use of residual hearing is the development of optimum hearing aids. Timberlake (33) reported to date, 1938, the development in commercial hearing aids and the use of word tests in the individual selection of the aid. Niemoeller (24) discussed the various classes of mechanical and electrical aids, the principles underlying their construction, the special uses they may have, how their value may be judged, facts concerning their manufacture, and comparative price ranges. Knudsen (19) described the construction and advantages of the vacuum tube aid and its present limitations. He also indicated the advantages of binaural hearing aids over the monaural instrument. Neuschutz (23), a deafened subject, analyzed and answered the difficulties that must be overcome in adapting oneself to the use of hearing instruments. She discussed the educational, social, and psychological adjustments to be met by the deafened individual.

Studies of Teaching Procedures

There have been descriptive articles concerning content and method but practically nothing in the nature of research beyond the nursery school. Earhart (7) described and evaluated a two-year experiment with a group of eight second- and third-grade children in a school for the deaf at Columbus, Ohio. The purpose of the study was to discover if young deaf children can grow into control of language commensurate with their level of intelligence through a school program which substituted numerous visual contacts with language forms in the vital situations which the hearing child experiences in everyday living. The results showed improved language development.

Vocational Guidance, Training, and Placement

Several studies have appeared relating to the vocational aspects of education for the deaf and hard of hearing. There was reported in tabular form (2) a classified list of vocations which were taught in schools for the

deaf with the direct purpose of fitting the pupils for some gainful education—agriculture, commercial work, handicrafts, semiprofessions such as commercial art and drafting, trades and industries, and vocational handicrafts. Woodruff (34) described the program in vocational agriculture carried on under the Smith-Hughes Act at the Georgia School for the Deaf, Cave Spring, Georgia. Jones (18) reported the results from a questionnaire survey of vocational guidance in fifty schools for the deaf. Forty-four percent of the schools had trained guidance workers, 40 percent had untrained workers, and 16 percent reported no one available. Twenty-nine schools stated that such service was available for them through the regular day school of their community. One-half of the schools kept no follow-up records at the time of the study. Only seven schools used standardized tests as an aid in guidance. Suggestions were made by the author of the report for a more adequate guidance program. Miller (22), from a questionnaire study of placement and follow-up work in schools for the deaf, found varying practices and a general recognition of the need for such placement. Hicker (13), the chief of the California State Bureau of Vocational Rehabilitation, appealed for the cooperative effort of all services in vocational training, counseling, and placement. Experience with several hundred deaf persons demonstrated the need for the development of social responsibility and self-confidence on the part of deaf applicants for employment. Rosenthal (29) reported questionnaire returns on the employment of fifty-one deafened and hard-of-hearing persons. The variety of jobs filled and satisfactory reports of employees indicated success for the large majority. Bluett (4) reported information on individual cases and offered vocational suggestions.

Needed Research

More accurate records of the incidence of hearing loss would be valuable. Results of hearing surveys of school children should be studied for the purpose of identifying and analyzing those factors which cause and condition hearing loss. Controlled studies of environmental factors and of methods that produce optimum development of language and speech in the preschool child are needed. Excellent settings for such studies are afforded in the nursery schools that have reported experimental programs.

Studies should be made of the use of hearing aids in which language growth at elementary-school age is recorded in terms of the length of instructional periods and the nature of learning activities. The selection of suitable curriculum experience, including vocational opportunities, offers another area for study. Studies that measure the results derived from lip-reading instruction for the hard-of-hearing child who can continue his major work in the regular school organization are advised. The present status of research relating to educational provisions indicates that concerted attack by research departments of universities and by schools which face the problems would be helpful.

B. Psychological Studies Related to the Education of the Deaf and Hard of Hearing

RUDOLF PINTNER

Learning Ability

Performance scales and tests, such as the Pintner Non-Language Mental Test, are widely used in studying the learning ability of deaf children. Samples of deaf children tested by means of various performance scales all show mean or median IQ's below 100. Amoss (35) reported a median IQ of 94 for 288 cases tested by the Ontario School Ability Examination. Roth (53) reported a mean IQ of 89 for 201 cases tested by various performance tests. Bishop (36) gave results for 90 deaf and hard-of-hearing children on the Arthur Performance Scale and found a median IQ of 97. The evidence from these and earlier studies seemed to point in the direction of a low-average IQ for deaf children on performance intelligence tests. Springer (55) used the Goodenough Drawing Scale with 330 deaf and 330 hearing children. Although the deaf tended to achieve slightly lower IQ's than the hearing children, a mean IQ of 96 indicated for the deaf children approximately average intelligence as measured by this scale.

At the college level, Fusfeld (40) reported results for deaf college students at Gallaudet on the American Council Psychological Examination and found that the median score for the deaf fluctuated between the 32d and 55th percentile for hearing students during the five years covered by his report. Fusfeld also compared deaf students with hearing students on standard college achievement tests.

Pintner and Lev (52) gave a verbal group intelligence test to a large sample of hard-of-hearing children, but in addition they gave a nonlanguage test to some of the larger group. They found the expected lower IQ for the hard of hearing on the verbal test, but no difference between the two groups on the nonlanguage test. They suggested that the slight retardation on verbal tests might be due to a language handicap. In concrete or nonverbal intelligence the hard of hearing may be equal to the normally hearing.

Special Abilities

Long's study (44) in 1932 is still the outstanding investigation of the motor ability of the deaf. He used eight different measures of motor ability and, with the exception of the sense of balance, found no difference between his deaf and hearing groups. Stanton (58) made a thorough study of the mechanical ability of the deaf by means of the Minnesota Mechanical Ability Test. The deaf group were about equal to the hearing control group, but both groups fell below the published norms of the test. Lyon (45) in an earlier study tested deaf children on this same test and found them below the hearing norms. Morsh (47) also reported on certain motor tests given to deaf and hearing subjects.

Language Development

Recent work by Keys and Boulware (42) showed that progress in language during the period of a year was much greater for children having 21 to 60 percent hearing than for those below 20 percent hearing, and also that there seemed to be no difference in language gain between those who lost their hearing before the age of two and those who lost their hearing between two and five years of age. The Psychological Division of the Clarke School for the Deaf (39), under the direction of F. and G. Heider, recently published the most thorough and extensive investigation of the written language of the deaf up to the present time. They analyzed 1,118 compositions of deaf and hearing children and made a detailed study of the differences found to exist between these two groups. The deaf showed immaturity in the development of their written language. The detailed findings of this study were too extensive to summarize here. In this same monograph (39) there appeared also studies of the phonetic symbolism of deaf children and of the spontaneous vocalization of fourteen young deaf children in free play and in experimental situations.

Lip reading is an important educational skill taught in schools for the deaf, but thus far it has resisted accurate measurement in an objective manner. Heider (39) and Mason (46) have probed into the possibilities of the use of the motion picture in developing a standardized test of lip-reading ability.

Personality Adjustments

Much of the work on the personality of the deaf consists of giving standard adjustment or personality tests to deaf children and comparing them with the published norms or with hearing control groups. Springer (56) and Springer and Roslow (57) have published comparisons of deaf and hearing children on the Brown Personality Inventory. These reports, as well as an earlier study by Lyon (45) in which he used the Thurstone Personality Schedule, showed the deaf to be much more emotionally unstable than the hearing, so much so as to cast doubt on this method of procedure. Brunschwig (38) experimented with adjustment schedules constructed for hearing children and concluded that they were unsatisfactory for the deaf because of the great language handicap of the deaf. She therefore constructed an adjustment inventory especially for the deaf. When this inventory was used to compare deaf and hearing children of the same age, she found the deaf only slightly below the hearing and concluded that deaf school children feel almost as well adjusted as hearing school children. Pintner and Brunschwig (49) used this same inventory to compare children in four schools for the deaf taught by different methods of instruction and found that manual pupils scored lowest, but that there was no difference in adjustment score between pupils using the oral method and pupils using a combined oral and manual method. They also found that children who

came from families where there were no other deaf individuals made the poorest adjustment scores.

The Haggerty-Olson-Wickman Behavior Rating Schedule was used by Springer (54) and by Kirk (43). The results were not conclusive. Teachers of the deaf as a group seemed to rate their pupils more severely than did teachers of the hearing, although this was not true for all such teachers. Pintner, Fusfeld, and Brunschwig (51) have reported results for deaf college students and deaf adults by use of a slightly modified form of the Bernreuter Personality Inventory. The modifications consisted of simplification of the language of the inventory. They concluded that deaf adults on the average tested slightly more neurotic and slightly less dominant than hearing adults.

The fears and wishes of the deaf child have been investigated by Pintner and Brunschwig (50). Deaf boys checked about the same number of fears as the hearing boys, but deaf girls checked many more fears than the hearing girls. The Vineland Social Maturity Scale has been used with the deaf by Bradway (37) and with both the deaf and hard of hearing by Streng and Kirk (59). Bradway found a mean social quotient of 81 for the deaf. Streng and Kirk (59) found a mean SQ of 96.2 for the deaf and hard of hearing taken together as a group. Pintner (48) reported on a general adjustment test and on a personality inventory for the hard of hearing. He found that slight loss of hearing seemed to have no effect upon reported feelings of adjustment, but as hearing loss increased the child tended to check more items indicating less desirable adjustment. Similarly in his results on personality traits, he found no difference between normal and hard-of-hearing children with regard to ascendance-submission or introversion-extroversion, but he did find a slight difference in emotional stability, those with marked hearing loss showing on the average the poorest emotional stability scores. Habbe (41) worked intensively with a small group of hard-of-hearing adolescent boys and found no special personality difficulties arising specifically out of their hearing loss.

Conclusions Concerning Psychological Studies

The average deaf child differs substantially from the average hearing child in intelligence and school achievement; the hard-of-hearing child seems to stand midway between the deaf and the normally hearing child. Loss of hearing affects language development and this is immediately and significantly reflected in the educational achievement of the child. It would seem also, but to a lesser extent, to be reflected in any measure of intelligence involving language. With respect to intelligence measured by means of nonlanguage material, the results at present seem to suggest that the deaf are also retarded here, but that the hard of hearing are not. Further investigation is needed at this point.

In the area of personality the various studies so far would seem to show that there is no such thing as a specific "deaf" personality. The deaf and the hard of hearing vary in personality make-up to the same extent as do

the normally hearing. However, loss of hearing to any degree does present difficulties which the individual has to face. How he will react to this additional problem in his life will depend upon many factors, among which are the degree of hearing loss and the time of occurrence of this loss. Those who are profoundly deaf and those who are born deaf or become deaf in early life are severely handicapped in normal language development. This handicap tends to prevent normal participation with others and makes the education and personality development of the deaf difficult.

The past decade, building upon work done previously, has shown a gratifying number of studies dealing with the psychology of the deaf and the hard of hearing.

C. The Speech Handicapped

SARA STINCHFIELD-HAWK

The most comprehensive study yet made in this country on the speech handicapped was the report prepared for the White House Conference on Child Health and Protection in 1930 by West, Travis, and Camp. One of the most important portions of the report consisted of recommendations for follow-up work. It is timely to note here what those recommendations were because recent research indicates that progress is being made in respect to them. They stressed the need of extension of school speech-clinic facilities both in urban and rural districts, the need for the understanding of what is meant by speech hygiene; the need for furtherance of ways and means of caring for speech defectives by school administrators and teachers; the need for providing teacher-training facilities in this field of education; and the need of further researches as to causes, conditions, prevention, and treatment of various types of speech defects.

Current Research in Speech at University Centers

The chief research studies in speech pathology, phonetics, psychology of language, and childhood speech development are being carried on in the university laboratories and in some of the larger nursery schools. Several institutions have made studies under research grants. A recent study (106) was that of the Hill-Young School of Los Angeles, an observation center for students in speech and psychology at the University of Southern California. Under a Rockefeller grant, studies have been made of motokinaesthetic training for children who do not acquire speech readily by eye or by ear; recordings of children's speech have been made for study purposes, and films of the therapeutic methods have been prepared for use by teachers, parents, and graduate students.

As to the types of training and research in speech pathology in California universities, those under way in the psychological laboratory at the University of Southern California are typical. There are studies involving the effectiveness of auditory, visual, kinaesthetic, and verbal

factors in learning speech, and of individual differences in the use of these factors in the acquisition of new skills and units of behavior. Another project has involved a comparative study of the behavior, particularly of the expressive components, of delayed speech and the speech of normally speaking children. Theses by Beckey (62), Bancroft (61), and McGuire (91) and articles by Travis (110, 111) indicated the nature of some of these studies.

The University of Wisconsin is engaged in an intensive study of hearing problems relating to speech, with West supervising much of the work. Kantner and West (86, 116) made significant contributions in the field of kinesiologic phonetics. Kopp (89) contributed certain metabolic studies of stutterers. The Flo Brown Memorial Laboratory at Wichita, Kansas, cooperating with the School of Pediatrics of the University of Wichita, is making intensive studies of the development of spastic children and of their speech, as well as of cardiac rhythms of stutterers and of sex-linked mechanisms involved in stuttering.

At the University of Iowa some of the most extensive and detailed studies of speech have been made. The works of Travis, of Strothers and his assistants, and of Johnson have been published in the Iowa University archives in speech and psychology and in the various publications on speech pathology. The report by Travis and Eagen (113) on the conditioning of the electrical response of the cortex is only one of many examples that could be given. The papers of Johnson (85) and of Travis (112) relating to summaries of trends and needs bear mention here because of the extensive research these two specialists have carried on. Northwestern University has devoted much time to teacher-training phases of speech work, to study of childhood speech, and speech clinical work. The University of Minnesota has given much time to studies on the speech of birth-injured children. Rutherford (102) has cooperated in this field. Studies of speech re-education of stutterers and the incidence of stuttering are represented in Brown's report (68). Dusenbury and Knowler experimented with symbolism of voice and action (75). At Indiana State Teachers College is one of the newest and best-equipped speech laboratories. At the University of Missouri studies have been made of conditioned reflexes and inhibition in relation to stuttering by Moore (92).

An inspection of thesis subjects in the field of speech pathology at these and other institutions indicated a wealth of research under way. Many of these research articles have been published or briefs and announcements made of them in speech periodicals. An excellent source of bibliographical reference for speech publications has been provided in the recent volume, entitled *Bibliography of Speech Education*, by Thonssen and Fatherson (109).

Terminology and Speech Classification

The classification and definition of speech defects outlined in the report of the White House Conference of 1930 have been widely used for

school children. Speech classifications and glossaries of terms have appeared since that date in publications by Bender and Kleinfeld (64), and by West, Kennedy, and Carr (117). In order to find a common ground and to establish a terminology in speech defects as used in this country and abroad, the American Speech Correction Association some years ago appointed a terminology committee which published its first dictionary of terms in 1931 (101). An enlarged and modified dictionary of terms dealing with disorders of speech appeared in the March issue of the *Journal of Speech Disorders* for 1941. This is the result of years of research and study on the part of the committee, and it possesses the advantage of collaboration with writers from abroad who are familiar with the terminology in other countries in the field of speech pathology.

Studies of Normal Speech and Language Development

As an aid to understanding the symptoms and causes of speech disorders, attention has been focused on the normal language and speech development of infants and preschool children. Typical recent studies of language development include Davis' study of relation of repetition in children's speech to measures of language maturity and the situational factors (73). This study from the University of Iowa on extemporaneous speech of each of 62 children, aged twenty-four to twenty-six months, showed that repetition of syllables, words, and phrases combined gave a fairly normal distribution for all children. These data seemed to indicate that repetition is an element that occurs in the development of speech for most children.

Templin and Steer at Purdue University (108) made their first report on a study of the growth of speech in preschool children. The growth in articulatory development was recorded regularly by speech clinicians. Voegelin and Adams (115) made a phonetic study of young children's speech. Palmer (99) described a plan for a longitudinal study of the vocalization and of the speech of children from birth on. Eisenson (76), in his book on the psychology of speech, gave attention to the development of language and speech in children. It is impossible to mention or to review all the excellent studies which have been made, and for a more complete record the reader is referred again to the *Bibliography of Speech Education* (109).

Gesell's studies (79) of infant growth from the Yale Psycho-Clinic have furnished excellent material on the nature of language development and its social aspects. Chapters on language development in recent child psychologies have offered for the average student a background of perspective for the understanding of speech deviations. Brooks' *Child Psychology* (67), for example, included such a chapter.

Studies of Speech Disorders

Stammering—In the section on research studies, reference was made to investigations on the nature and treatment of stammering. Recognizing

the need for more intensive studies in the field of speech pathology, the American Speech Correction Association (60) recently devoted its entire convention programs for two successive years to a discussion of the causes and treatment of stuttering. Contributions were received from speech pathologists from all over the country. Bluemel (66) not only presented various theories of stammering but gave helpful outlines for treatment. Stuttering as an emotional and personality disorder has been described by Solomon (104) and Bryngelson (70). Travis (110:193) presented recently the thesis that "stuttering is a defense designed to prevent anxiety from developing when certain impulses of which the stuttrer dares not become aware threaten to expose themselves" Bender (63) studied a post-pubertal group of stuttrers and discovered more personality maladjustments than in a control group of nonstuttrers. He attributed the difference to the individual's own reactions to his handicap.

Two books, one by Blanton (65) and the other by Gifford (81), were written primarily for stuttrers and are based upon the theory that stuttrng is caused by some emotional disturbance. Later in this chapter, under the subject of programs, reference is made to treatment for stuttrng in school children.

Disorders of speech due to birth injury—With the growing recognition of the mental and social potentialities of birth-injured children, the speech specialist has recently given special attention to their speech problems. Hull (84) made a study of the respiration of fourteen spastic paralysis cases during periods of silence and of speech. Records showed malfunctioning in breathing that could be defined and partially explained. Further research in this area was advised. Davison (74) reported case studies and described in detail methods of developing motor control and speech response. Rutherford (103) described a procedure to make the child aware of his secondary movements which are habits that he no longer needs and to develop in him the power to induce or inhibit them. Fagan (19) reported methods used for speech education with nine spastic children, ages three to fourteen years.

Other types of speech disorders—Brown and Oliver (69) reported a qualitative study of abnormalities of the organic speech mechanism associated with cleft palate. Stunchfield-Hawk (82) described speech defects sometimes associated with malocclusion. Neilsen's publication (95) reported research on the subject of aphasia and Fröschels (78) presented European views on the subject. Orton (97) published a brief summary of his findings from a ten-year study of language disorders.

School Surveys of Speech Defects

Loutitt and Hall (90) presented data from a questionnaire study of the schools of Indiana and the incidence and types of speech defects reported. Carhart (72) analyzed returns of 405 questionnaires involving 144,570 students. Of the total number, 21 percent were judged by their

teachers to have speech defects; more speech disorders appeared among boys than among girls, and these defects decreased progressively from the freshman to the senior level. Only 4 percent of the schools studied had definite programs, 39 percent reported only incidental attention, and 57 percent reported no attention given to the matter. Morris (93) made a survey of a random sampling of 178 high-school sophomores for voice and speech defects and found 14 percent to have such defects. No significant difference between normal and speech defective groups was found in respect to intelligence, sex, or nationality background.

Programs of Speech Hygiene and Speech Therapy

Reports on school programs are more or less descriptive or expository. Buckley (71) reported a year's speech work in the Cleveland public schools, with special reference to the contribution made by the kindergarten and first-grade teachers in the correction of minor defects. Stoddard (107) described the special teacher's plan for the treatment of stammering in the Detroit public schools. Gifford (80) described the technics for the correction of stammering used in the schools in California. Knudson (87) made a study of the oral-recitation problems of stutterers. Heltman (83) described a program of speech correction set up in a number of New York State communities in which the speech clinician gave courses to teachers, including clinical demonstration of diagnosis and treatment of the speech problems found in the grades of the attending teachers.

Nylen (96) presented the viewpoint that guidance and speech work have a common purpose at the high-school level. Raubicheck (100) described the nature of disorders and methods for treatment at the secondary level. Otto (98) and Young (118) described ways and means for providing instruction of pupils with speech problems in rural areas.

Bender and Kleinfeld (64), West, Kennedy, and Carr (117), Van Riper (114), and Stinchfield (105) presented comprehensive treatises on the diagnosis and treatment of speech disorders. These contributions supplied help to the supervisor and teacher in understanding speech problems. Koepp-Baker (88) furnished a manual in which he described clinical treatment for speech problems. Murray (94) regarded speech training as essentially a reconditioning of the individual to social situations and presented a manual designed to help the college student understand and improve his "speech personality."

Present Trends in Speech Research

The present trend is toward integration of speech with all other branches of learning, and the social aspects and economic advantages of normal speech or rehabilitation of speech are gaining in recognition and importance. Speech regarded from this viewpoint is tangent to child psychology, physiology, anatomy, chemistry, physics, psychoanalysis, mental hygiene, sociology, and all forms of public speaking or private speech. The opportunities, therefore, of enlisting the cooperation of specialists in

other fields of study are great. Only through concerted study can more valid findings be made. The number of universities and colleges ready to adopt speech programs and to carry on research in the field is increasing. The trend in programs of speech hygiene and speech therapy is to train the classroom teacher to assume the responsibility of speech hygiene with her pupils in order to enable her to correct minor speech defects and to aid in the prevention of the development of disorders. The teacher who is a speech specialist then takes as her responsibility the definitely serious or clinic problems.

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CHAPTER VI

The Visually Handicapped, the Delicate, and the Crippled¹

CHRISTINE P. INGRAM

IN 1936 a review of literature concerning the mental hygiene and adjustment aspects of the three areas considered in this chapter was prepared by Baker (2), and in 1939 a brief report was made by Lee (29). Whereas both of these reviews were of necessity limited, the present treatment will be more inclusive in its scope. Selections will be made from the literature covering approximately the past three years, with the addition of certain significant contributions of an earlier date, which may aid in giving a more nearly complete picture.

A. The Blind

A selected annotated bibliographical guide to literature relating to the blind was compiled by Lende (30). The sections giving references on the preschool child, psychology, education, vocational training, and vocations are of particular significance for education.

Kirby's report (25) of the Committee on Statistics for the Blind presented the 1938-39 findings of annual ophthalmological examinations on standardized forms of 3,868 pupils from thirty-nine schools for the blind. Tables giving etiology, eye conditions, degree of loss, and ages were given. Results showed a complete loss of vision or a greater loss than 20/200 for 77 percent of cases. The enumeration showed that more than one out of every ten had sufficient sight to be educated in a sight-saving class. Lack of such facilities in day schools was responsible for the presence of some cases; in other instances the school for the blind was not alert to recognition of individual eye condition.

Lende (31) edited a series of reports by authorities on various aspects in the presentday education and treatment of the blind. One of the problems discussed was the child with borderline vision who is not classifiable as educationally blind. Four case studies of adjustment of borderline pupils in Cleveland day school braille and sight-saving classes were reported. Another chapter was devoted to the subject of the preschool child.

The Preschool Child

There has, within the past five years, been a growing literature on the blind preschool child. McVickar (39) and Bershow (3) described nursery schools for blind children. Fjeld and Maxfield (13) stated the

¹ Bibliography for this chapter begins on page 326.

need for research because of the many special problems, such as "blindisms," nervousness, personality maladjustments, and retardation which blind children develop. An outline for a proposed program of research and research activities in progress at the Arthur Sunshine Home for Blind Babies were described.

Maxfield (38) reported a detailed study of method preliminary to a longitudinal investigation to extend over a number of years. Eight visually handicapped children were used as subjects and a verbatim report form of the observational method, based on experimental procedures found satisfactory with normal children, was employed. Maxfield stated reasons why longitudinal studies, though difficult to carry on, would yield results beyond those of cross-sectional studies. A second report by Maxfield (37) described a three and one-half year study of vocabulary building for the preschool child and included vocabulary lists. Mention is made of Taber's thesis (45), since it furnished a careful experiment in home guidance for the young blind child. Over a nine-month period she measured the responses of a totally blind child to the normal activities and requirements of home life. Certain measurable results were reported. McVickar (40) studied the voluntary behavior of twenty blind and partially sighted preschool children over a period of five years. She observed differences between the totally blind and the partially seeing. Her recordings showed a similarity in the behavior of the blind and partially-seeing children at the three-year level, but sufficient differences at the five-year level to make the needs of the two groups very different in respect to ability and interests.

Mental and Educational Tests

Hayes (19) has continued his studies of tests adapted for the blind and in this report gave a history, inventory, and criticism of both mental and achievement measurements. Achievement tests adapted for use in recent years were grouped under those for elementary school, for high school, and for diagnostic and remedial teaching. Research on a 1940 adaptation of the Hayes-Binet Scale and on a selection of tests from the L and M Forms of the Terman Revision is under way. Hayes (21) in an earlier article gave evidence of low scores in literature and history on the Stanford Achievement tests and made suggestions for the use of tests to locate inadequacies for which enriched experience should be provided. In another article (20), he gave further suggestions to teachers for the use of available suitable tests. Fortner (14) reported the adaptation of the Kuhlmann-Anderson group intelligence tests for Grades VI to IX. Davidson and Brown (9) described the construction of a test in point-scale form for testing children visually handicapped to any degree. Hayes (19) referred to its use in his experiments. An adaptation of the scholastic aptitude test of the College Entrance Examination Board made at the request of the New Jersey Commission for the Blind was reported by Brigham (4).

Lowenfeld (36), a Viennese teacher, reported on experimental and comparative studies of the partially sighted and the blind child's visual and nonvisual sources of drawing, painting, and sculpture. Copies and photographs of the children's art products from which the studies were made were included. Klein (26) described an individualized approach to the study of problems of perception in the blind and partially sighted.

Personality Adjustments

Farrell (12) presented the special nature of adjustments needed by the blind which suggested the value of a mental hygiene approach in the educational program. Post (42) described the work of the girls' counselor in a school for the blind in securing cooperation of agencies outside and in promoting socialization within the school. Brown (5) reported quantitative data on the administration of the Clark Revision of the Thurstone Personality Schedule to 218 students in schools for the blind and to 359 high-school seniors. The incidence of neurotic tendency was higher among the blind than among the seeing. Harvey (18) favored the practice of enrolling the advanced blind pupils in the day high school of the community.

Adaptations in Curriculums, Methods, and Teaching Aids

Frampton (15) edited a book on the education of the blind, which embodied a compilation of reports made by the staff of the New York Institute for the Education of the Blind. Curriculums and methods based on enrichment at the elementary and secondary levels and vocational and prevocational experiences were reported. Special educational problems of the deaf-blind and mentally retarded blind were also considered. Qumby (44) made a study of the curriculums for residential schools. Typical problems in the education of the blind, courses of study from kindergarten through senior high school, and programs in music, physical education, and manual arts were surveyed and reported. Recommendations were made as to the need of experiments on length of school day, the reorganization of the school program to make more satisfactory provision for individual differences, better vocational guidance and placement programs, and need for training in leisure-time activities.

Chatfield (8) emphasized the importance of a planned program for the teaching of beginning reading. Prine (43) discussed arithmetical difficulties and diagnostic and remedial technics of instruction. Adaptations in teaching methods or aids in the nature of models and adjusted equipment were reported by Hebbeln (22, 23) in physics; by Morgan and Wellington (41) in geometry; by Hill (24) in natural science and in history; and by Loomis and Mitchell (32) in chemistry. Burnside's monograph (7) on loom accessories for blind weavers showed by description and picture a helpful kind of information made available for the teacher. Numerous references to the use of the Talking Book (33, 34, 35) in schools and classes for the blind have appeared. Lowenfeld (34) furnished a graph on results of Stanford Achievement Tests in schools for the

blind and called attention to the slower rate of braille reading and low achievement in literature and history. On this basis he recommended wider use of the Talking Book. A catalog of available records arranged by Lowenfeld (33) for grades and junior and high-school level indicated that the number of titles below the sixth grade was limited. Plans were reported under way (35) to develop more material for the lower levels.

Reports by Buell (6), Emanuele (11), Landis (27), and Lang (28) indicated continued experimentation in physical activities and recreation to discover means of extending participation and developing socialization on the part of the blind. Lang (28) reported adaptation of a baseball game with the use of sound effects. Hall (17) described the special characteristics and needs of the deaf-blind and practical procedures for their education.

Training and Salaries of Teachers

Lowenfeld (35a) reported a study of the training and salaries of teachers of the blind in residential schools, made in 1940 by the American Foundation for the Blind. The study covered 44, or 88 percent, of the residential schools in the United States, and 703, or 74 percent, of the full- and part-time teachers. He found that the teachers "have the same professional training as do teachers in public schools, but that their salaries are far below those paid to public-school teachers." Their length of tenure was also shorter, giving rise to the conclusion that "the low salaries in schools for the blind and the heavy teacher load tend to offset the attractiveness of the work. . . . It [is] imperative that the authorities of schools for the blind adopt a decided change in salary schedules if they are to retain well-trained teachers until they acquire sufficient experience to reach their maximum efficiency."

Vocational Training of the Blind

Athearn (1) has made a comprehensive analysis of vocational problems related to occupational changes, specialization, counseling, and training. A table was also included showing percent of blind workers employed in major occupational groups. Certain changes in vocational curriculums taking place in schools for the blind were reflected in such reports as that by Fries (16) on the future of piano tuning and Delamarter's description (10) of a program for vocational agriculture at the Michigan School for the Blind. This latter program under Smith-Hughes aid offered courses in poultry raising, fruit growing, floriculture, and landscape gardening.

Summary

Most of the material cited in this chapter came from members of the staffs engaged in the state residential schools for the blind. There were few articles from the public day school. The subjects of intelligence and achievement tests and of the preschool blind reveal some planning which suggests that findings may in the future become increasingly valuable.

Research is needed in the subject of personality adjustment. An increasingly open-minded attitude in curriculums and methods, including vocational training, suggests that teaching staffs might well cooperate in carefully planned and controlled studies which would yield valid basis for changes and improvements.

B. The Partially Sighted

Eye Care

Knighton (53) furnished ophthalmic information on the child's visual response and the use of his eyes to be taken into account by both the pediatrician and psychologist. Hitz (50) submitted a preliminary report of the use of the Snellen Chart, the Betts Ready To Read Tests, and a third ophthalmic test, the complete plan designed as a screening process for testing the school child's useful vision. Psychological and personality adjustments relating to eye care were discussed by Rosenthal (56) and by Waters (58), presenting the medical social worker's role. Case studies of individual patients are included in the latter.

Medical and Educational Trends

Reference to trends and developments appeared in two articles, one by Hathaway (49) and one by Lawes (54). Hathaway discussed recent medical and optical developments, namely, diathermic procedure for operations on detached retinas, corneal transplantation, and contact and telescopic lenses. She included also advances in illumination, in auditory aids—the radio and the talking book—and in vocational guidance. Lawes summarized the special types of materials and lighting conditions that have been developed for sight-saving classes and made recommendations for needed research. A successful experimental rural program in caring for 38 visually handicapped in 31 school districts in Allegheny County, Pennsylvania, was described by Cohen (47). It was initiated by the Pennsylvania Association for the Blind in 1934 and because of its success recommendation was made that the state special education department should take it over.

Instruction Suggestions

Soares (57) recommended the use of the dictaphone as an aid in sight-saving classes having large enrolments and described methods of using it in intermediate grades and in high school in the city of Detroit. Phelps (55) and Burress (46) furnished material on the values of handwork in the sight-saving class, suggested units, and included annotated references on the subject. Various types of visual handicaps in school children and teaching technics to meet those handicaps were described by Davis (48). Kastrop (51) presented methods in beginning reading for the sight-saving pupil. Kniewel (52) listed sources of vocational information for the teacher. The assets of wholesome attitudes toward a range of occupations and the analysis of personal qualifications for the job were discussed.

Summary

The literature indicated that research on the medical aspects was continued, but that there were practically no objective or controlled experiments in methods and classroom technics. Studies of eye habits and the size and kind of print should be made to discover optimum methods and materials for different kinds of eye conditions. Research might well be carried on in diagnostic and remedial procedures suited to the visually handicapped, in methods and means of evaluating pupil progress, and in the use of mechanical aids, such as the dictaphone and Talking Book, as time savers for the teacher or reader. The whole area of the school's part in meeting the mental hygiene needs and personality adjustments of the visually handicapped child calls for scientific study.

C. The Delicate

Much of the literature on delicate children, or children of lowered vitality as they are sometimes termed, has treated of the medical and health aspects because of the growing realization that discovery and treatment is essential during the period of childhood. Strachan (72) presented an excellent review of the literature through 1937. At that time she noted that valuable information was available in the fields of tuberculosis, heart disease, and nutrition regarding the problem of delicate children, but that methods for selection for medical and educational treatment were still inadequate. A carefully selected and extensive bibliography was included.

Children with Heart Disease

Hood (64), director of the Crippled Children's Division of the United States Children's Bureau, stated that funds under the Social Security Act are now available for developing services for children with heart diseases and conditions leading to it, such as rheumatic fever. Nine states and the District of Columbia have made plans for 1941 to utilize the medical and social services offered. Silver (71), cardiologist for the schools of Newark, New Jersey, described the initial heart examination for all children entering gymnastic instruction and reported that cardiac conditions were located in 1 percent. Robinson (69) stated that 1.5 percent of school-age children have organic heart disease and that about 44 percent of this group have conditions serious enough for special-class placement. He emphasized the need for appreciating the significance of the condition and for providing rest and suitable exercise as a protection. Robinson (70) stated that individual programs with advice to parent and teacher are essential. Sutton (73) ascribed to rheumatic heart fever an annual death toll of 1 percent for the child population and urged that the symptoms be recognized and care provided.

Children with Diabetes

Brown and Thompson (59) studied case records and interviewed sixty juvenile diabetic patients. Data pertaining to body growth, intelligence, heredity, sex distribution, and incidence of acute infections were compared with equivalent data from nondiabetic siblings and from the records of diabetic subjects in other investigations. The intelligence of the experimental group showed no deviation from the average and no significant deviation from that of their sibling controls or from the average of Minneapolis children. No characteristic differences in personality were discovered. Teagarden (74) reviewed the literature on the intelligence of diabetic children and noted that certain studies reported a distribution of intelligence higher than the average. She then reported six case studies in which four of the six were below average. While she drew no conclusions, she pointed out that for certain reasons the incapable child suffering from this disease may not always be recognized as a diabetic.

Children Suffering from Epilepsy

Kugelmass and Poull (65) reported on the mental growth of epileptic children. Davis (62) described the various convulsive states of epilepsy and new methods of study by encephalography. Patry (68) stated twenty principles that the teacher should take into account in her guidance of a child who suffers from epilepsy. Crile (61) described the medical and educational program of a twenty-four-hour school for epileptics established in 1935 under the direction of the Detroit Board of Education. This arrangement made possible carefully controlled schedules for the children and periodic observations of mental and physical changes.

School Programs for Delicate Children

Wheatley (75) discussed the work of the school physician as a medical adviser and described a New York City project in which 160 physicians cooperated in studying the general health, living conditions, dietary and health habits of more than 5,500 below-par children. Important outcomes were changed attitudes on the part of the school physician toward his responsibilities and valuable material for use in educational work with teachers, parents, and community.

In a report (67) of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, the advantages and disadvantages of open-air classes were stated. Changing concepts affected the nature of the care recommended for the below-par child. The findings suggested that the question of special classes or other provisions for special health treatment was one that could be answered only by a study of local needs and facilities. It was recommended that a school health program should be extended to all, with modifications as needed for children who are below par physically. A national and representative committee of educators, hygienists, nutrition workers,

and physicians was appointed by the National Tuberculosis Association to consider the treatment and education of the below-par child (60). Significant recommendations were that the home should share with the school the responsibility for the children's below-par status and that school procedures be adapted to the individual pupil's need. DeKonig (63) gave specific suggestions for teacher guidance of parent cooperation in prevention as well as improvement.

Laton (66) described a high-school program of health service, which provided a rest-room to which below-par pupils might be assigned for certain periods. Relaxation and removal of pressure through this means made it possible for many convalescing and below-par pupils to carry on educational programs. Children of lowered vitality are also among the numbers who are cared for in hospitals and by home teaching as described in the next section of this chapter.

D. The Crippled

The literature on the crippled child has given emphasis to the close relationship between the medical, physical, and educational aspects of the program for the child with this type of handicap and the emotional and social needs of his development. Legislation on behalf of the cripple has received considerable study. The number of articles on the subject of cerebral palsy in children is increasing. Hospital programs, as well as day school programs, are included in this section.

Legislation and Services

Hood, director of the Crippled Children's Division of the United States Children's Bureau (85), described the medical, surgical, therapeutic, vocational, and educational services that are being promoted under the Social Security Act in the forty-eight states and two territories. In a second article (86), he reported that continued progress has been made in the development of services under the Social Security Act. Every state in 1940 was receiving federal grants-in-aid for services for crippled children and had an active program in operation. He stated that registration of crippled children was more nearly complete than at any time in the past. Howett (88) summarized answers to questionnaires sent to all states in 1939 concerning laws for (a) locating cripples, (b) furnishing medical, surgical, and after-care, and (c) education and vocational assistance.

The New York City Commission for the Study of Crippled Children (79) furnished a statistical analysis of the physical and social status of 16,731 registered crippled children. All agencies furnishing care in New York City—medical, social, educational, vocational, and recreational—were studied. Recommendations for further improvement of the work of agencies and the coordination of their services were made. McIntire (94) presented the several steps required to secure for the individual eventual vocational

placement and pointed out the way in which lay and professional services can be coordinated. Baker (76) analyzed the motives of those who contribute to programs for crippled children.

Emotional and Social Needs

Reznikoff (102) stated that for too long the problem has been approached from the physical point of view rather than on the basis of the individual's emotional reactions. Case abstracts were given to support this view. An exploratory attempt was reported by Kammerer (90) to investigate the psychological behavior of eighty crippled children of both sexes at the age of thirteen, fifty of whom suffered from osteomyelitis and the remainder from scoliosis. All came from the lower socio-economic level and were patients of a hospital for children. Intelligence and personality tests were given and interviews held with children and parents. Whereas the scoliosis group differed significantly from the Stanford-Binet norm, the osteomyelitis group did not. A low positive correlation was found between maladjustment and duration of the crippling condition. Social and personal inferiorities were not traceable to the handicap and very little evidence to support the theory of compensation was found. No other general psychological differences were discovered between the scoliosis and osteomyelitis groups. No evidence supported the thesis that physical defects are the cause of abnormal personalities. Ball (77) stated that the problems of adjustment of crippled children in the family, school, and community are not peculiar to the handicap, but may be intensified by it. She advised that treatment must be based on factors of relationship within the family and the resources in the community. Dimchevsky, a psychiatric social worker (80), discussed the worker's responsibility in respect to the personality needs of the handicapped. She gave striking illustrations of individual children and their parents who have problems in adjustment to face. Fifield (81) and Mulcahey (96) brought out that physiotherapy is a broadened function which should include counseling and mental health adjustments.

McGrew (93) described the fears and insecure feelings of pupils entering a hospital. Student nurses were trained to provide a program of treatment and teaching which aided stabilization and security. Mendenhall (95) described the program of the Philadelphia orthopedic school in making available to the children varied experiences in music, rhythmic, dramatics, interpretive and folk dancing, clay modeling and painting, and other phases of art work. She stated that the school can hereby provide outlets for self-expression both at home and in school. Ingram, Bryne, and Johnson (89) collaborated in a series of three articles devoted respectively to the values of the special unit in the elementary school, of the special school for crippled children only, and of the special school providing for all types of physically handicapped. Specific illustrations were given in the description of programs in New York State, Minneapolis, Minnesota, and Des Moines, Iowa.

Hospital Schools and Classes

Fitzgerald (82) described the educational program at Grasslands Hospital, Valhalla, New York, initiated in 1936 for children of preschool age who were hospitalized for an extended period. Nursery-school and kindergarten experiences adjusted to the physical limitations of the child proved invaluable as a preparation for first-grade work. Matheson (92) made a comprehensive study of legislation concerning hospital schools and an investigation of present practices in 162 hospital schools with a total enrolment of 5,378 children in 33 states and two territories. A conservative estimate of the number of children in American hospitals who need such care was placed at fifty or sixty thousand. The number of existing hospital schools was estimated at from 300 to 400. The number increased each decade from the date of establishment for the first class in 1861. In seventeen states, legislative provisions have been made relating to hospital schools or to special schools and classes which might be included as hospital schools. There was much variation in the types of provision made by these laws, in respect to status, support, and administration of the schools. Practically all the schools were in urban communities. Of the total number of school-age children reported hospitalized, 66 percent received instruction. Variation characterized all phases of school programs. It was noted that too many hospitals operated without the benefit of local or state supervision by educational authorities.

Closely related to hospital teaching is the teaching of home-bound patients. Oettinger (97) described in detail a home-teaching project for 200 children suffering from cardiac, orthopedic, and other ailments carried out by the Visiting Nurse Association of Scranton, Pennsylvania, with WPA assistance. The physical, emotional, and educational needs of the child were carefully considered to the end that each child might experience self-confidence and security.

The Child with Cerebral Palsy

Carlson (78) described in detail the problems met in the physical and mental development of the spastic child and the procedures used in muscle re-education. He emphasized the part which education plays in providing interests which help the child to forget himself and thus to achieve better muscular control. He also described the problems encountered in education and means used for relaxing physical education and strain. Phelps (98) described the program as it is carried on at the Children's Rehabilitation Institute in Baltimore. This school is for children affected with cerebral palsy who, after a trial period of three months, prove to be capable of improvement both physically and mentally.

Phelps (99) differentiated between the characteristics of the spastic as distinct from the athetoid type. He (100) described five lines of investigation in connection with patients suffering from cerebral palsy: (a) the

type of motor disturbance, (b) localization of brain hemorrhage, (c) testing of mentality, (d) psychological characteristics, and (e) various forms of treatment. He gave a brief summary of methods of treatment used with the spastic and the athetoid types; and he emphasized (99) their potentialities, holding that only about 25 percent are feeble-minded.

Pusitz (101) gave a comprehensive description of cerebral palsy with recommendations for physical treatment and speech work based on the psychological-psychiatric approach. Hoopes (87) wrote an autobiography describing her condition, which is that of congenital cerebral palsy, with inability to speak or to walk, and she discussed the development of physical, mental, and social factors in her life. Clinical notes were included by Phelps. Hiss (84) discussed the educational needs of the child afflicted with cerebral palsy. Strauss (103) analyzed the problems of the teacher and emphasized her need for ingenuity in guiding the child to help himself. Girard (83), a physician, discussed in nontechnical language the essential facts of spastic paralysis and made numerous suggestions concerning physical therapy, speech training, occupational therapy, and other problems to be faced by parents of the afflicted child.

Vocational Training and Placement

There has been very little reported in the area of vocational adjustments. Teller (104) furnished a brief report of a follow-up study of 51 crippled children graduated from the high school for crippled at Spalding School, Chicago. Statistics were presented concerning advanced study, employment, attitudes of teachers and employers, necessary adjustments, and suggested changes in the high-school course of study, as reported by the persons participating. Of the 51 children studied, 36 were employed, 15 not employed, 20 had gone to college, and 5 earned degrees. The majority of these graduates stressed the need for training during school life to establish self-responsibility and to minimize self-consciousness.

Kratz (91), the director of vocational rehabilitation in the United States Office of Education, traced the development of (adult) rehabilitation services in the United States from their inception in 1920 up to the present, indicating the trends toward case work and the inclusion of treatment for the home-bound. This study of adults is mentioned because it suggests trends which are also apparent in the educational program for children.

Recommendations

Research studies are advised in the following areas: types of handicaps that will benefit by home teaching, the cooperation of school and home in personality adjustment, the particular problem of the social and intellectual potentialities of the child suffering from cerebral palsy, and the development of suitable play and work programs for children limited in physical activity.

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CHAPTER VII

The Negroes¹

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APPROXIMATELY 12,000,000 of the total population of the United States are Negroes who have been a part of the national citizenry since the adoption of the Fourteenth Amendment to the Constitution of the United States in 1868. Most of these people, the largest minority group in the United States, live in the southern part of this country. The story of their education in the southern states in which there is a policy of separate schools for the whites and the Negroes falls into several well-defined periods. The first period extends from the introduction of Negro slavery in 1619 to the 1830's. The second extends from the 1830's to the Civil War. The third period includes the years from 1863, when the Negroes were emancipated by proclamation of President Lincoln, to 1876, when the process of Congressional reconstruction was concluded. The years from 1876 to about 1900 may be considered the fourth period, and the years from 1900 to the present represent the period in which the greatest progress has been made in the education of Negroes, and which has witnessed the widest study and publication on problems pertaining to it. In this chapter reference is made particularly to material which has appeared on the subject during the past five years.

Race Relations

Bowen (5) attempted to answer the question, "Are the Negroes an unassimilable minority in the United States? Or could they, if given a fair deal by the white population, become a contented and constructive part of the community?" He presented a study of race segregation and interracial cooperation in religious organizations and institutions in the United States. He traced the turbulent course of the Negro race through American history, in housing, schools and churches, business and industry, and asked whether the spirit of idealism characterizing the New Deal will affect these conditions among the Negroes.

A wealth of material was presented by Eleazer (20) on racial differentiation, the Negro in America, sentiment in the South for emancipation, the controversy over slavery, the educational progress, and the cultural contributions of the Negroes since emancipation. Factual data were given to stimulate inquiry and to promote better interracial understanding. A symposium of ten essays, edited by Thompson (54), dealt with race relations with special reference to the United States and more particularly to the southern states. It furnished interesting presentday views of various aspects of the race problem. Thompson concluded that race relations in

¹ Bibliography for this chapter begins on page 337

regard to education were not improving as fast as seems desirable; that the Negro's educational opportunities will not improve more rapidly than his general social relations; and that Negroes should have a greater part in the control and administration of their schools. Wilkerson (55) suggested three steps: (a) evaluation of the present status of Negro separate schools; (b) determination of the adequacy of public education in the states having separate systems; and (c) suggestions, in the light of the findings, for the improvement of education for Negroes in states having the dual system of schools.

Davis and Dollard (17) analyzed the effect of the social caste and the formation of personality. The background material used concerned more than two hundred Negro adolescents. Johnson (30) mentioned the fact that race relations in the South since the introduction of slavery in 1619 have been largely caste relations. Crum (15) described Negro life as it actually is and said that a pressing social need today is some racial basis for a better understanding of racial problems. Canady (13) undertook to find the correlation between the intelligence level of Negro students at West Virginia State College and the occupations of their fathers. He found considerable overlapping. Later (14) he made another study to find sex differences in intelligence. The data failed to show significant differences.

Legal Aspects of Education

Ford (23) pointed out that seventeen southern states and the District of Columbia are required by legislative enactment to maintain separate schools for colored and white children. Mangun (37) reviewed the important court decisions bearing on Negro education, as well as on other aspects of Negro life. He reported that generally equal rights are expressly guaranteed, but that this does not mean that equal rights always obtain in actual practice. According to Brawley (7), the decision of the Supreme Court of the United States in the *Gaines* case of Missouri, in December 1938, ultimately will have far-reaching effects on Negro education, especially in those seventeen southern states which, under their constitutions and laws, have long followed a policy of separation of the whites and Negroes in schools. The Supreme Court ruled in the *Gaines* case that a state must provide substantially equal facilities for the education of the two races within the state. Wilkerson (55) noted that all southern states denied Negroes admission to their state universities, but some of these states provided scholarship aid to Negro students to do graduate and professional work elsewhere.

Educational Practices for Negroes and for Whites

Concerning differences in facilities provided for Negroes and whites in those states that follow the policy of separating the two races in schools, Raynor (46) showed that Negroes in seventeen southern states and the District of Columbia, while seeking educational facilities equal to those

enjoyed by the whites, suffered discriminations in instructional equipment, in qualifications and salaries of teachers, in transportation facilities, and, in some places, in length of school terms. He pointed out also that there were inadequate opportunities in some localities for secondary education and for graduate and professional work in public institutions. However, he also indicated that, since the decision was rendered in the *Games* case increasing opportunities for graduate and professional work were being provided for Negroes.

Meece (39) made a comparative study of educational facilities for whites and Negroes on the elementary- and secondary-school levels in the state of Kentucky and found that in that state there was no discrimination against the Negroes with respect to length of school term provided. The length of term was the same for Negroes as for whites in all the districts which maintained schools for Negroes. In equipment the schools for Negroes were not as good as the schools for white children and schools were accessible to a larger proportion of white than of Negro pupils. There appeared to be little difference in the amount of training of white and Negro teachers, and in length of teaching experience the Negroes exceeded the whites in the elementary schools and the whites exceeded the Negroes in the secondary schools. The lack of more remunerative work in other occupations was pointed out as perhaps the most important factor which made for the longer tenure of Negro elementary teachers. There was very little discrimination in the salaries paid to white and Negro teachers in the county school districts, the greatest amount of discrimination in this respect being in the independent school districts. White elementary teachers were superior to the Negro elementary teachers in general scholastic ability as revealed by tests based upon academic subjects at the college level and superintendents generally considered their white teachers superior to their Negro teachers in teaching ability.

Rural Conditions

It appears that Negro education is more neglected in rural than in urban localities. Caliver (8) so concluded from his study of Negro schools in twenty-eight counties in six southern states, in which he set out to compare the extent of educational facilities for Negroes with those for whites. It was indicated in this study that the amount of education offered in rural districts is meager in regard to length of term and attendance; that the quality of education is low with regard to types of schools, training and salaries of teachers, percent of over-age children, and percent of failures. Caliver (9) pointed out further that the South cannot provide educational opportunities equivalent to those in the North and that the federal government must of necessity aid.

Thompson (53) urged better preparation of Negro teachers, greater participation by Negroes in the administration of Negro schools, and suggested that Negroes should resist further extension of separate schools. Bond (4) pointed out that urbanization and industrialization have resulted in im-

proved schools for Negroes. He believed that further improvement in rural education and in the plantation economy must await fundamental changes in the structure of the economic system. Jones (31) gave a valuable description of twenty-five years' work in the supervision of rural schools for Negroes in the South under the support of the Anna T. Jeanes Fund, which was established in 1908. Redcay (47) gave the first historical presentation of the activities of the John F. Slater Fund in the county training schools, the forerunners of the Negro high schools in the South. This study showed that, notwithstanding the amazing growth in secondary education for Negroes, there were (in 1933) about 190 counties in the South entirely without public secondary facilities for Negroes.

Federal Relations

Davis (18) discussed the relations of the federal government to the seventeen land-grant colleges for Negroes. He said that none of them had been able to maintain work leading to graduate degrees, and that, while the Land-Grant Act stressed military training, none is provided in the Negro land-grant colleges. Lane (35) reviewed the relations of the federal government in Negro education from the Civil War to date and concluded that the question for the Negroes as for the whites now is: Shall Congress distribute federal subsidies in elementary, secondary, and other phases of education? Daniel and Miller (16) charged that Negro youth are not receiving a just share of NYA assistance and cited a long list of recommendations to remedy the situation. Bethune (3), on the other hand, said that in a recent year 55,000 Negro young people received federal NYA assistance in high schools, colleges, and graduate schools, and pointed to the phenomenal advance of the Negro since slavery.

Wright (57) showed that 15,000 Negro youth have been taught to read and write in CCC camps since 1933; that 10 percent of the CCC enrollees are Negroes, representing the percent that the Negro population bears to the total population. She held that racial segregation in camps should be discouraged, citing evidence that mixed camps in New England and in the western states had been quite satisfactory. Oxley (43) pointed out that between 175,000 and 200,000 Negroes have been enrolled in the CCC camps and that Negroes have received a fair share of benefits under the Civilian Conservation Corps.

Extent of Secondary and Higher Education

Knox (34) reviewed the development of secondary education for Negroes in the United States from the Colonial era to the present and pointed out that the number of approved Negro high schools is on the increase, that the number of such high schools accredited by the Southern Association of Colleges and Secondary Schools in 1931 was only twenty while in 1936 it had increased to eighty-three. Jordan (32) urged high-school training for domestic service, farming, beauty culture, and other occupations. However, his study of more than 1,000 high-school graduates in North Carolina

showed that the vast majority of them went into unskilled and semiskilled vocations. Melvin and Smith (40) reported that rural Negro youth were especially handicapped by lack of high schools.

Probably more has been said about higher education for the Negro than about any other single aspect of his education, especially since the decision in the Gaines case in 1938. Brawley (7) noted that even in the face of this decision it may be a long time before Negroes are admitted to state universities in all the southern states. Jenkins (28) gave data concerning enrolments in some Negro colleges and universities. He showed that there was an increase of about 15 percent from the academic year 1935-36 to 1936-37. He also pointed out that the number of institutions offering collegiate work for Negroes increased from fewer than 12 in 1916 to 121 in 1936; enrolment increased from 1,643 to 35,000 for the same period; and the number of books in the institutional libraries increased from 75,000 to 1,000,000.

Suitability of the College Curriculum

Gallagher (25) raised the question: Does the four-year college course unfit the Negro for life? He expressed the idea that there need be no fundamental difference between the college best suited to Negroes and that best suited to whites. Armstrong (2) directed attention to the fact that the type of college open to Negro youth has offered only liberal arts or liberal arts and practical arts, that Negro colleges have lagged in meeting the occupational needs of Negro youth; and that the pressing problem of the Negro college is its need to shape its program toward bringing about a change in the social pattern. This study also suggested that the vocational type of training is best adapted to a majority of Negro youth. Canady (12) stated that colleges for white students have been making much greater progress in adjusting their programs to individual requirements than have Negro colleges, but that only a beginning has been made in either case. He criticized Negro education as a whole for being mediocre in quality and lagging behind the general educational procession. Lee (36) included in his history of the Negro a guide for the evaluation of courses in high schools and colleges.

Concerning the Negro junior college, Ford (23) showed that there are twenty-seven junior colleges for Negroes in the states having separate schools, as compared with 491 for white students in the same states. He indicated some advantages of the junior college for the Negro, such as, inexpensiveness, nearness to the home, usefulness as a terminal course for those unfitted for a four-year course, and closer supervision of individuals than that provided in the universities and large colleges. Oak (42) believed that there are too many Negro colleges and that their geographical distribution is unsatisfactory. Raper (45) stated that there are enough college graduates each year in the South, both Negro and white, to accomplish noticeable improvement in race relations, if only they possessed the knowledge, attitudes, and skills required to accomplish improvement.

Number of Degrees Granted

McCuiston (38) showed that between 1914 and 1936 the master's degree was conferred on 1,476 Negroes, but that only one-fourth of these degrees were conferred by Negro colleges; that during the same period the doctorate was received by 139 Negroes, all of which were conferred by institutions outside the South, that no Negro institution offered work beyond the master's degree; and that less than 25 percent of the Negro leaders had been trained in the South during the past quarter century. Knight and others (33) reported that in the period from 1929 to 1939 the undergraduate enrolment of the principal degree-granting institutions for Negroes in Alabama increased from 258 to 2,970, that the number of degrees granted by those institutions during that time increased from none to 367, but that none of the institutions concerned provided any graduate work.

Johnson (29) presented results of an extensive and careful study of the objective records of professionally trained Negroes in this country from the time the first academic degree was conferred upon John Russwurm by Bowdoin College in 1826 through 1936. About 43,000 graduates were used as the basis of the general study, and an intensive analysis of 5,500 graduates was made. The study showed the number, distribution, and occupations of the Negro graduates, gave an analysis of some of the social forces that determined the number and status of these graduates, discussed the methods used in the higher education of Negroes in the United States, and presented some of the problems in that field.

Vocational Education and Guidance

The American Youth Commission has been interested in Negro youth problems and has issued some important publications in this field. Frazier (24) directed a study for the Commission in which he organized personality data under the topics of youth's experiences respectively in the family, the neighborhood, the school, the church, and in connection with hunting for jobs. Reid (49) summarized data from many sources on Negro youth, relating to problems of inequality, discrimination, restriction of rights, and limitation of franchise, which condition the environment and development of Negro youth.

Patterson (44) pointed to needed changes in vocational education for Negroes, the primary one being "to intellectualize the so-called menial occupations." Numerous job possibilities were suggested, out of which it was hoped that Negro leadership would develop. Rosenberg (50) gave some interesting facts concerning graduates of Hampton Institute to show that 100 percent of the women graduates and 95 percent of the men graduates were employed in teaching, clerical, newspaper, government, insurance, and social service positions. Hyde (27) made a study of twelve schools in Indiana and Kentucky to determine the occupational choices of Negro boys and conditions affecting them.

Hill (26) mentioned some obstacles in finding employment, the direc-

tion which vocational guidance and training should take, new kinds of jobs, and general occupational trends. He urged the promotion of interracial contacts, work experiences while learning, and increasing social understanding in the schools. Caliver (11) gave extensive information resulting from the national survey of vocational education and guidance sponsored by the United States Office of Education, urging the development of better guidance programs for Negro youth. In a later study (10) he analyzed the relation of the occupational status of Negro high-school graduates and nongraduates to their school experiences, urging more exploratory opportunities and improvement of guidance programs.

Bowling (6) pointed out that colleges for Negroes have failed to recognize occupational trends and are preparing too many students for business and the professions, whereas a greater opportunity exists in agriculture, industry, and mechanics. He said that conditions in North Carolina illustrate the futility of permitting more Negroes to prepare for professional careers than the economic status of the population warrants. Wilkerson (55) pointed out that training and education are not guarantees against dependency and destitution. He further stated that Negro schools and colleges lacked adequate equipment to carry on vocational education; that Negro youth's best chance was in manual or vocational work rather than in "general education"; that some states had received money partly on the basis of Negro population and had expended it for white schools or for white students. Thompson (52) claimed that the federal vocational program as a whole was available to Negroes to only two-thirds the extent to which an equitable distribution of opportunity would entitle them. Dollard (19) showed by a study of a southern community how literacy and vocational training tend to advance the social and economic status of the Negro, and how lack of schooling and inferior opportunities tend to restrict advancement.

Contributions of Negroes

It is likely that the situation with regard to the education of the Negro is much better than at any previous time, in spite of some opinions to the contrary. Embree (21) declared that poor schooling and other discriminations have acted to prevent the Negro from making his contribution to American life; that while the Negro is referred to as lazy, he has done the major part of the labor in the South for 200 years; that John C. Calhoun's cry, "Show me a Negro who can parse a Greek verb or work a problem of Euclid," has been answered many times; that the Negro's zest for life and his creative ability are among the nation's assets. It is now recognized, as the Advisory Committee on Education pointed out (1), that the low level of education which exists among Negroes is a severe burden not only on themselves but on all who employ them or otherwise have dealings with them. This situation obtains even in the northern states where the large influx of Negroes from the South makes the quality of

their previous training a matter of importance to the community in which they dwell and work

Smith (51) presented a series of sketches of the careers of Negro Congressmen, classified according to the division of the Congress in which they served, the states which they represented, and the time of their tenure—whether before or after the period of Congressional reconstruction. This study contained also useful tables of information concerning the percent of Negroes in the population of the various American states and counties, lists of Negroes in all Congresses and their education and professions. Eppse (22) undertook to show how the history of Negroes may become a more vivid and worthwhile subject for study in schools and colleges. He enumerated some of the larger gifts and endowments to Negro education and gave an interesting account of some contributions Negroes have made to America in the fields of literature, art, music, and invention. Under Newbold's (41) direction, a sponsoring committee, working in cooperation with the University of North Carolina, Duke University, and the state department of public instruction in North Carolina, prepared biographies of five Negro leaders of the past half-century. The effort was to preserve in permanent form the inspiring record of the lives and activities of these leaders and to provide an opportunity for cooperative study by groups of white and Negro college students and faculty members.

Woodson (56), in a comprehensive presentation of the Negro's background of development, called attention to a changed point of view which emphasized "that the Negro be educated to his race rather than away from it (56-321)." He held that if from childhood the Negro were made aware of the history of his race, its achievements, and its potential contributions to its own group, as well as to others, he would gain a new conception of his role in society. Reddick (48.1363) stated that one of these days "history textbooks will be written differently. Then, no nation will be singled out as 'God's Country' instead, the story will be told in terms of the whole society, in terms of the interplay of all the forces which have made for the upbuilding, the destruction, and the rebuilding of civilizations and cultures."

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CHAPTER VIII

Bilingual Children¹

L. S. TIREMAN

THE POINT OF DEPARTURE in this survey is 1932. In that year publications appeared which cover much of the work in this country up to that time. Cook's bibliography (19) on the education of native and minority groups was extensive, and it included the social, educational, and economic studies from 1923 to 1932. Sanchez (56) presented a critical study of forty investigations dealing with the intelligence of bilinguals, validity of intelligence tests, environmental influence, and language handicaps. Although this review discussed chiefly Spanish-speaking subjects, it was sufficiently comprehensive of the general work in bilingualism, and hence no reference will be made here to studies prior to its appearance.

The first part of this chapter will be restricted to the psychological and sociological aspects of the problem; the second part to the curriculum problems presented by bilingualism.

A. Psychological and Sociological Aspects of Bilingualism

The Language Background

Pintner (50) investigated the IQ of bilinguals. Four hundred and thirty Bohemian, Italian, and Jewish children from three New York schools were divided into groups on the basis of English or non-English-speaking backgrounds. They were tested by the Pintner-Cunningham and the Pintner Non-Language Primary Tests. In two schools, the non-English group did relatively better on the nonlanguage test. In the third school, no difference between the two tests was found. "It would seem from this study that great caution should be exercised in the comparison of children with different language backgrounds where they are being compared by means of verbal intelligence scores (50-240)." Arsenian (3, 4) studied the effect of language; 1,152 Italian and 1,196 Jewish children, born in the United States, nine to fourteen years of age, were given the Hoffman Bilingual Schedule, the Pintner Non-Language Test, and the Spearman Visual Perception Test. They were further examined as to relationship of bilingualism to age, sex, and socio-economic status. It was concluded "that bilingualism does not influence—favorably or unfavorably—the mental development of children ages nine through fourteen in the various groups studied in this investigation (3-153)." Hill (29) compared Italian children of Grades I, II, and III, who spoke Italian at home, with those who spoke English at home. Verbal and nonverbal intelligence tests and performance tests were used. No statistically reliable differences were revealed. Hill believed that the effect of bilingualism on the measured intelligence of this group could be disregarded.

Broom (9) administered the Miller Mental Ability Test, the McCall

¹ Bibliography for this chapter begins on page 350

Multimental Scale, and the Henmon-Nelson Test of Mental Ability to the Spanish-American and Anglo-American grades of an elementary school from 1935 to 1938. The median IQ's for the Anglo-American on the three tests were respectively 123.3, 113.7, 112.6. For the Spanish-American the median IQ's were 94.5, 91.6, 92.9. "Language handicap and differences in educational opportunity during depression years detracted from the 'equal opportunity to learn,' affecting the Spanish-American group more than the Anglo-American group and tending to lower scores of individuals in the former group yielded by the mental tests (9:31)."

School Adjustment and Verbal Intelligence

Pintner and Arsenian (51) posited that "if bilingualism is a cause of school maladjustment, then children with high bilingual background, therefore under the influence of bilingualism to a greater degree, should show more maladjustment than children with low bilingual background (51:261)." The subjects were 469 native-born Jewish children in Grades VI and VII. High and low bilingual groups of boys and girls were equated on socio-economic status, compared as to their performance on the same intelligence and adjustment tests. No significant differences were found. Consequently it was felt that bilingualism bore no relation to verbal intelligence or school adjustment in this situation. Hoffman (31) constructed an instrument to determine the extent of bilingual background to which an individual is exposed. Its reliability and validity were tested on groups of Italian and Jewish children. "Bilingual background is not associated with chronological age nor with grade status for ages ten to fourteen and Grades V to VIII . . . Results obtained for a group composed of several nationalities may be contrary to those found for any particular one of the nationalities of that group. It is best therefore to treat each nationality separately. . . . The extent of bilingual background is associated with achievement on verbal material, but not with performance on material of the nonlanguage type (31:65) "

Barke (5) compared bilingual schools in the primary grades where English was introduced as a special subject with two bilingual schools where English was the medium of instruction and Welsh taught as a special subject. "When mean mental ages are compared, the monoglot schools are superior in each case on the verbal tests with an average superiority of .8 of a year, but on the nonverbal tests it is the bilingual schools that are superior with an average superiority of .44 of a year (5:247)." In 1938, Barke and Williams reported a further study (6). The bilinguals were given verbal mental tests in both Welsh and English. The same tests were given to a similar monoglot English group in English. Performance and vocabulary tests were also administered. The difference between bilingual and monoglot groups was insignificant when measured by a mental test in which no language was used. The bilinguals were distinctly inferior when measured by a mental test in their second language. When the test was given to each group in its mother tongue, the monoglot was markedly superior. "The inference is that these bilingual children, aged ten and

a half years, and drawn from two adjacent schools in a mining district, are unable to do justice to themselves in either language (6:67) "Neither in their mother tongue nor in their second language did they have a vocabulary equal to that of the monoglot.

Walters (71) expressed an opinion, unsupported by evidence but valuable since he is a trained psychologist and is in the midst of the bilingual situation of Puerto Rico, that there is no justifiable theoretical ground for the assumption "that the simultaneous learning of two languages produces a mental obfuscation or tangling which impedes the learning of other subjects." He admitted from observation that such interference is present, "but by the same observation amount of interference does not seem to be very serious (71:11)." Smith (61) on a basis of the analysis of records of early speech of eight children during their sojourn in China and upon returning to the United States, suggested that there is confusion when the child hears both languages from the same source. But these records were made at an earlier age than the age Walters presumably was discussing. Smith (60) reported another study of the language development of children from two to six years of age, born in Hawaii, who came from a non-English-speaking ancestry.

The Influence of Experience and Environment on Test Results

Davenport (22) selected 210 pairs of Mexican siblings and 62 pairs of non-Mexican siblings in Grades I, II, and III. They were tested by the Goodenough Scale with directions in English and Spanish. The correlation between IQ's of the Mexican siblings was .25, for non-Mexican siblings, .51. "Older and younger children in Mexican families are much less alike in intelligence than are older and younger children in non-Mexican families." This "showed that some factor of importance had influenced those children which normally did not influence non-Mexican children in the same school grades. . . . The implication is that experience (or other contemporaneous factors) was responsible for the difference between older and younger Mexican siblings (22:306)."

Sanchez (55, 57) sounded a word of caution in the uses of mental tests to the effect that grave mistakes may occur if there is no community of experience. Results are valid only when items of the test are as common to each child tested as to children upon whom the norms are based. When the vocabulary used in the Stanford-Binet for years III-VIII was studied, it was found that there were eighty-four words that did not occur in a vocabulary used as a desirable goal for non-English-speaking children in New Mexico. Seneur (58) administered to 453 pupils in Grade IV-B, largely from foreign families, the Haggerty Intelligence Test and the Pintner Non-Language Mental Test. "Pupils from homes that use a foreign language tend to get results on the Haggerty Test which indicate lower ability than they evidently possess. . . . The intelligence of pupils in a foreign-language community is inadequately represented by the use of results of either of the two tests alone. If only one test is used, however, the Pintner test seems to be the better instrument (58:441)."

Forty Italian pupils of the same age and environment were tested by Hill (28). In their first year in school they were given the Stanford-Binet; in their fifth year the National Intelligence Test; in their sixth year the Otis Self-Administering Tests. The IQ's obtained on the Stanford-Binet correlated respectively .72 and .78 with the National and the Otis tests. IQ's from the last two tests correlated .86. The Binet IQ's of these bilingual children were excellent indicators of their future performance on verbal tests. Consequently, the author believed that the part of bilingualism in accounting for low IQ's has been overestimated. Garth and Johnson (26) made a survey of the abilities of 683 Mexican children in El Paso and New Mexico with the use of the Otis Classification and Otis Intelligence Tests. "These data show that the Mexican child is more like the American white at the early ages but less like them as they grow older in both achievement and intelligence as measured (26 229)." Caldwell and Mowry (11) measured Spanish-speaking pupils by use of essay and objective types of examination. Language difficulty operated to penalize these pupils when either type was used but the handicap was greater with the essay than with the objective type. Jalota (33) found the practice effect of the English form upon the scores of the vernacular form to be 0.52 percent, or practically negligible.

Cattell (14) criticized severely the medley of tests commonly used for measuring intelligence on the basis of their inclusion of environmental skills and then of their being used to prove that the environment affects intelligence. "Most of current statements about IQ's are really statements about special environmental skills, functions of fluctuation, experimental error of measurement, test sophistication (14:161)." He outlined a nuclear list of objects common to the observation of men wherever and however they live. From these he selected seven subtests to compose a culture-free intelligence test. No evidence is presented as to its validity and reliability.

Socio-Economic Status

Arsenian (3) pointed out that "the problem of bilingualism in the United States is one phase of the larger problem of immigrant adjustment to the conditions of life in this country (3 67)." In studying native-born Italian and Jewish groups he found that the coefficient of correlation between bilingualism and socio-economic status was $-.20$. That is, "higher bilingual status is accompanied by lower socio-economic status (3.81)." Manuel (40) evaluated the socio-economic status of 98 Spanish-speaking children in Grades II to V by the Sim's Score Card. The average of the group was between "low" and "very low." When these findings were considered in conjunction with the IQ's obtained by the Spanish edition of the Stanford-Binet, it was seen that "the low mean intelligence and the achievement of Mexican pupils is associated with a low mean socio-economic status, but the correlation within the group is low. An accurate prediction of the success of an individual pupil cannot be made on the basis of social status (40:38)." Neff (46) summarized the studies bearing on the relation of socio-economic status and intelligence and stated that the 21 points mean

difference in IQ found to exist between children of the lowest and highest status may be accounted for entirely in environmental terms (46.755).

Use of Translations of Tests

A Spanish translation of the Stanford Binet Scale and the English edition was used by Manuel (40) to study the 98 children reported above. An IQ of 82.5 was reported on the Spanish and 80.5 on the English edition. The suggestion was made that language factors need much consideration in evaluating the abilities of bilingual groups. "A Spanish translation of the Stanford-Binet Scale can be used to advantage in the prediction of the achievement of Spanish-speaking pupils in the first and second grades, but used alone it is inadequate for individual prognosis (40:37)." Mitchell (44) reported a study of 236 children in Grades I, II, and III of Mexican parentage. Two forms of the nonverbal Otis Group Intelligence Scale, primary examination, were administered, with directions for one form in Spanish and for the other in English. For all three grades there was a difference in mean IQ of 9 in favor of the Spanish test. The author does not believe that this difference can be used as a corrective figure because of the small number of cases used; yet he believed that bilingual children work under a serious handicap. Jalota found that the total disadvantage suffered by the average first-year high-school student "when he is given simple intelligence tasks in English as compared with his scores if the same tasks had been set in the vernacular (Hindu) amounts to 27.81 per cent (33.77)."

Comment

Research with bilingual children has been impeded by a lack of suitable measuring instruments and disagreement among psychologists on basic fundamental principles. Much of the experimental work deals with small groups and factors extremely difficult to equate; too little is known about different national groups, yet conclusions are sometimes drawn that are sweeping in nature. Amidst disagreement and conflicting opinions, the careful student can only tentatively accept such judgments and wait for corroborative work.

B. The Curriculum

There is available a steadily increasing body of material pertaining to the instruction of non-English-speaking pupils, but far too little is based upon approved research. The considered opinions of conscientious and experienced workers, however, should not be ignored. Descriptions of successful practice must guide teachers until there is adequate support or denial by experimentation.

General Bibliographies

Cook and Reynolds (20) presented an annotated bibliography of publications dealing with native and minority groups from 1932-34. Reynolds

(54) gave a description of the situation of the Spanish-speaking children in the Southwest up to 1932—housing, segregation, teaching technic, teacher training, economic and social status, intelligence, achievement, and scholastic progress. A general bibliography was included. Coleman and King (17) analyzed and evaluated the materials and technics that have been proposed for teaching English to young Spanish-speaking children of the Southwest. The nature and content of various state courses of study were discussed. Attention was also given to the courses of study in outlying areas of the United States, Canada, South America, and Cape of Good Hope. Coleman and King (16) presented also an annotated bibliography of 1,025 articles, both general and scientific, appearing from June 1932 to June 1937, and dealing with all phases of language teaching. This compilation gave particular attention to the secondary curriculum, but there were other types of references as well.

Use of the Mother Tongue or a Second Language

The use of the mother tongue versus the use of a second language for instructional purposes is a debated question in the United States. Most of the statements are merely unsubstantiated opinions. In Puerto Rico much work has been done in this field. As pointed out by Padín (48) the problem has been too often linked with political considerations. He gave a historical account of the methods used in Puerto Rico, though admitting that they were not based upon experimental evidence. Abel (1) gave a brief description of bilingualism in Belgium in 1932. Two (in some places three) languages were officially recognized and the schools were required to meet the problem. In general, the mother tongue was the language of instruction until the fifth year. At that time the second language became optional for special study two hours each week. The secondary schools gave much more time to the languages, with a proficiency test required for college entrance. The teachers in bilingual areas were expected to know both languages.

Braunshausen (8) asked: What are the intellectual and moral effects produced by bilingualism? After a brief summary of the experimental evidence in Europe, he stated that the results were somewhat unfavorable to bilingualism, though he pointed out that there were many factors to be considered. The second part of his book is devoted to methods of learning a foreign language. Bovet (7), from his experience in Europe, brought out a point that he believed ought to be thoroughly considered in the United States, but is generally overlooked. He held that not only the individual should be safeguarded but also the interests of the state. America is rather generally criticized for ignoring the language of the home in the public schools, but perhaps this is a wise step from the standpoint of national unity.

State Courses of Study

The state education departments of Arizona (2), California (12), New Mexico (32), and Texas (63) have issued monographs pertaining to the instruction of non-English-speaking pupils. Some space was given to oral

language, but with too little attention to the differences inherent in the languages which caused a carry-over into the learning of the second language. The Arizona course of study included a number of definite suggestions for teachers. The New Mexico and Texas courses of study gave special attention to the reading problem with word lists and sample reading lessons. Hughes (32) included in the New Mexico course a list of 660 words with an analysis to show amount of agreement with other vocabulary lists.

Aids to Beginning Teachers

A number of writers have recognized the problems of beginning teachers and have attempted to give them help. Their articles (10, 21, 27, 30, 38, 39, 45, 52, 66, 68, 72) treated the extent and importance of the bilingual problem in our schools, the necessity of considering the background of the pupils, the preparation of vocabulary lists which will have social utility, emphasis on oral English, a strong reading program, and use of community resources. Powers and Hetzler (53) gave a brief report of special classes in the Seattle schools. Chinese and Japanese children who had gone to school in their own countries were placed for one or two years in special classes where they received special help in speech—pitch, intonation, and pronunciation. An annotated bibliography was included in the report. Coale and Smith (15) collected from successful teachers descriptive accounts of their teaching of English to bilingual children. These accounts included games, songs, reading, and conversation lessons from first grade to high school. Cook (18) listed fifteen teacher-training institutions which offer courses for teachers or prospective teachers in the education of native and minority groups.

Language, Speech, and Reading Activities

It is generally agreed that there must be a preliminary period in which language activities should be stressed (36, 52). Tireman, Dixon, and Cornelius (68) recommended that vocabulary become of first importance. They estimated on the basis of a rigid individual testing program that a native Spanish-speaking child could be taught to comprehend 633 words and use 567 words by the end of the pre-first grade if proper technics were employed.

The effect of kindergarten speech training on progress in the primary grades was studied by Fuller (25). Three groups were studied over a four-year period. Beginning in the kindergarten, one group received two semesters of speech training, a second group received one semester of training; and the third group received no speech training. The special instruction centered about vocabulary building and conversation. Pupils with speech training were slightly more successful in reading, made fewer failures, and completed the first two grades in a shorter time than the children without speech training. However, the median age and intelligence scores of the group receiving speech training were higher, at time of entrance to low first, than those of the group receiving no training.

Eaton (23), using the Thorndike English list, the Vander Beke French list, the Morgan German list, and the Buchanan Spanish list, found 739 words among the first thousand most common words in all four of the languages. This list he pointed out should be useful in selecting words for non-English-speaking pupils. West and others (73) attempted to develop a vocabulary of limited amount by which all ordinary communication in idiomatic English can be effected. As far as the reviewer knows, no one has used this material with young bilingual children.

Tireman and Woods (70) compared the aural and visual comprehension of English by 47 Spanish-speaking pupils in Grades V to VIII. Statistically reliable differences indicated better visual than aural comprehension. The difference was largely due to superiority in vocabulary. Testing with an audiometer showed that the difference was not caused by poor hearing. The authors advanced the explanation that these children suffered a handicap because they hear and speak little English outside the school. Coale and Smith (15) found in an extensive survey of the schools of Hawaii that "written English is much more successfully taught to the bilingual children in the islands than is spoken English. . . . The points of greatest difficulty—verbs, articles, and nouns—are those in which the Oriental languages spoken here differ most from English If more children could be helped by kindergartens or other means to attain a higher standard of speech before school entrance, it would be beneficial (15:127)."

Tireman (67, 69), Hughes (32), Hoard (30), Meriam (42, 43), Petterson and Johnson (49), and Potter (52) presented evidence favoring what might be called an "activity" type of reading, in which charts are used based upon experience of the children. It was believed that these charts are more interesting and meaningful to non-English speaking children than a book. However, as Stone (62) pointed out, there is likely to be an insufficient repetition of the minimum vocabulary. He believed that such a method "should parallel rather than supplant a systematic and sequential plan in beginning reading (62:109)."

Experimental Schools

The task of appraising practices and theories of teaching bilingual children is particularly difficult because it involves a long period and many children. Meriam presented reports of such a school (42, 43). His fundamental thesis was that too much time and effort had been given to the mere form of our language with insufficient ideas for expression in English. Traditional organization and curriculum were changed. The program of work initiated consisted of four major subjects (play, handwork, storytelling, and social studies) and four minor subjects (singing, dancing, bathing, and free play). "Whatever of English is acquired by these bilingual children is strictly incidental to the accomplishment of a larger objective—the improvement of the normal activities of children (43:33)." Meriam made little attempt to present objective measurement. He reported and interpreted certain practices which are based upon the definite assumption that English is best acquired as an incidental byproduct.

A partial report of another experimental school was presented by Tireman (67). San Jose School was a graded elementary school of some 500 Spanish-speaking pupils. A systematic attack was made on the teaching of reading. In the pre-first grades, carefully prepared vocabulary work was stressed. The progress of the program was examined each year for five years by the use of the Gates Reading Tests and the New Stanford Achievement Tests. Only the evidence regarding reading was reported. It showed better than normal progress in the second grade, normal progress in the third grade, and a rapid drop-off in the fourth grade, with over a year's retardation in upper grades.

The Nambé School is another school which has been attempting to find better methods of teaching Spanish-speaking pupils. Tireman (64, 65) reported that the chief emphasis in this school was upon a curriculum adapted to the needs of the pupils. Basically this is similar to Meriam's contention. However, the program differed radically. Management of land and conservation of resources were studied extensively throughout the grades. Environmental resources and experimental plots on the school ground were utilized to furnish the background for reading material and to stimulate more functional reading in general. Judging from the average daily attendance, which was 93 percent of the enrolment for the school year, one could say this type of program was popular with children and parents. In a countywide testing program the eighth grade of this school held first place.

An illustration of the type of work that should be more and more encouraged among classroom teachers of bilingual children is the experiment reported by Overn and Stubbins (47). A first grade was divided; 22 native-born Americans were in one section and 18 children from foreign-language homes (German, Russian, Hungarian) were in the other section. In November, the Pintner-Cunningham Primary Mental Test was given. The foreign-speaking group had an average IQ of 87, the American group 106. In May, the Metropolitan Achievement Tests were given. The American group had a grade equipment of 2.6 and the experimental group 2.4. Perhaps of more importance was the fact that the number of failures during the year of the experiment was reduced from 17, 16, and 22 in three previous years to 4. Unfortunately, the method of instruction was not described.

School Achievement

Two hundred and one junior high-school pupils were tested by Fritz and Rankin (24) with mental and achievement tests. The Sim's Socio-Economic Score Card was also used. Three instructional groups were formed on the basis of language. That the pupils from foreign-speaking homes were handicapped in English was revealed by statistical treatment. It was recommended as a result of the findings that special instruction be given in English to overcome this handicap.

The Inghs tests of English vocabulary and special subject vocabulary were administered by Johnson (34) to four high-school classes of Spanish- and Anglo-Americans. The Spanish-American pupils were found to be

retarded seven to twelve months in vocabulary, as compared with the Anglo-American pupils. Kelley (35) gave the Iowa Silent Reading tests to 692 pupils in Grades IV to VIII; 43.8 percent were Spanish-speaking. The Spanish-speaking pupils tested one year below the English-speaking pupils in practically all phases of reading, except in the seventh grade where they were at the norm in paragraph comprehension.

Smith (59) devised a test which indicated that children who were learning at the same time two languages of different order of reading direction (vertical, horizontal) make more reversal errors than when learning one language at a time. On the basis of the new Stanford Achievement Test, Manuel (37) found that in Grades II to VIII the Spanish-speaking children scored on the average one year lower in reading than in arithmetic; slightly better in arithmetical reasoning than in computation; and about one-fourth of a year lower in paragraph meaning than in word meaning. Callicutt (13) constructed a vocabulary test of words drawn from textbooks used by the children and gave it to Mexican and non-Mexican children in Grades III to VIII. The Mexican children scored below the non-Mexican.

Artistic Talent

There is very general opinion that Mexican children are exceptionally talented in art. The validity of this opinion was studied by Manuel and Hughes (41). Four hundred and forty Mexican and 396 English-speaking children in Grades I to IV were measured by the Goodenough Scale on the basis of both intelligence and drawing ability. The evidence showed that intelligence and drawing were closely related, but that this relation decreased as the children advanced in school. The general average ability of the Mexican children in intelligence and drawing compared favorably grade for grade with that of other children, but, when compared by ages, the Mexicans showed lower average scores and greater variability. The belief that the Mexican children are especially gifted in drawing is not supported by the scores at any level. Apparent talent may be a matter of training and interest.

Comment

It would appear from the studies presented that there is a need for more longitudinal, carefully equated, experimental investigations. For example, conclusions regarding the effect of teaching in the mother tongue or in a second language should not be drawn until the identical subjects are observed throughout the elementary grades and perhaps through high school. Important factors may be overlooked when attention is given only to central tendencies for large groups. Many of the problems confronting bilinguals are common to all pupils and will be solved as better measuring and diagnostic instruments are devised, as teaching load is reduced, as better trained teachers are provided, and as the parents reach an improved economic status. Meanwhile, it is suggested that more attention be given to the peculiar kinds of errors made by bilinguals in oral and written

English, reading, and thinking. Their individual errors should be intensively studied in an attempt to find the causes. Once these are known, curriculum adjustments are possible.

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CHAPTER IX

The Indians¹

WILLARD W. BEATTY, GORDON MAC GREGOR, and JOSEPH C. McCASKILL

EDUCATIONAL RESEARCH IN THE NARROWER SENSE has been almost completely absent in the field of Indian education and administration in the United States. Anthropological research, which has been voluminous, until recently has played very little part in guiding actual work with presentday Indians. The Meriam Report (*The Problem of Indian Administration*) of 1928 pointed out the manifold gaps in basic information which handicapped the work of the Indian Service, and since that time the studies made have been largely of a fact-finding nature. It is not easy to draw the line between studies which are related primarily to education and those which are primarily socio-economic, because many of the latter, properly interpreted, have important implications for Indian education.

One of the most important series of studies undertaken in the last decade has been by the Soil Conservation Service of the Department of Agriculture, cooperating with the Office of Indian Affairs (TC-BIA). This agency placed a staff of physical technicians, anthropologists, sociologists, and economists in the field at the end of 1935 and began a series of technical investigations of many problems existing on Indian reservations including the adjustment of the Indian populations to proper use of land, water, and other resources. The data and reports gathered by TC-BIA are intended to provide the Office of Indian Affairs with the necessary information with which to develop long-term plans for conservative use of Indian resources. The existing social organization of each Indian group and the degree to which assimilation to white ways of life has progressed were reported, and conclusions drawn as to the most effective integration of modern school instruction with reservation needs and life. None of these reports has been published, but they are available for reference in typewritten or mimeographed form in the files of the Office of Indian Affairs.

Land Use and Human Dependency Surveys

The nature of these surveys may be indicated from a brief summary of three of the more recent:

1. The Lower Brule Sioux reservation in South Dakota was studied in 1937 (11). Without irrigated lands and situated in the heart of the Dakota drouth area, the reservation has not been in a condition to support the resident Lower Brule Indians for nearly a decade. Only 18 percent of the tribe's income was derived from the land. Half of this came from working the land, the other half from land leases. Sixty-eight percent of the total reservation income was found to come from the federal govern-

¹ Bibliography for this chapter begins on page 360

ment in the form of made-work or relief, and 32 percent from private sources. Only three out of ninety-six families were without some form of relief aid. The original Indian communities derived from former encampments were well scattered for efficient utilization of range and available agricultural lands. As the population became increasingly dependent upon relief, the people moved to the agency community until 50 percent of the population was living there. To develop a self-supporting economy it will be necessary for these people to return to their former communities. The Indians had been previously living by land sales and leasing, and sales of capital livestock and horses. This economy, except for some leasing, has ceased. Proper land utilization is badly complicated by the present checkerboard pattern of tenure by whites and individual Indians. Fractioning of land allotments through inheritance is increasing. The drouth and economic depression only brought to a sudden climax the failures due to previous unwise land use.

The Lower Brule land estate has been increased through tribal and Resettlement Administration purchases. The development of a combined livestock and agricultural economy by Indians appears possible under a planned program of land use and community integration. Many of the former dry farms should be incorporated with the range and a balance achieved between range land and farm area for the production of winter feed. Proper control, use, and management of the range with its present complicated ownership calls for cooperation and consolidation. Education must facilitate the understanding of these problems and teach the technics of agriculture, stock raising, and business management if the Lower Brule are to change from a parasitic to an economically independent existence.

2. The survey at Fort Hall reservation, Idaho (13), in 1937-38-39 showed that the reservation possessed adequate resources to support the entire population, without subsidy, if these resources were utilized by the population. However, most of the land was allotted and many allotments were sold or redistributed through inheritance. This brought about a very uneven distribution. Income is also unevenly distributed, correlating closely with active participation in the cattle industry. Most of the Indians are petty landlords, leasing their allotments, and until recently much of their tribal reserve as well. In 1937, 95 percent of the Indian owners leased their property. While members of the older generations have adapted themselves to this condition, the younger Indians receive less rental income because they have inherited only fractions of their parents' allotment. The social life of the older reservation largely carried over from former culture, and, while satisfying to the elders, it is less satisfying to the children who are accepting white civilization. Full-bloods were found to be decreasing and mixed bloods increasing. The mixed bloods were found to be more socially acculturated, less stable, and tending to greater participation in cattle raising and farm economy for themselves. Proper land use, soil conservation, and long-term planning to bring the land back into use by the Indians will require active cooperation from them. Education

in the reservation day schools and nonreservation boarding high schools, to which the older children go, can be of great assistance in promoting these changes—aiding an understanding of new land practices and the possibilities of a new and improved livelihood.

3. The survey of California reservations (14) made in 1936 covered the Sacramento jurisdiction. This area includes all California north of Tehachapi Pass, except the northwest corner. Within the state are from 18,000 to 20,000 Indians with title to 570,000 acres of land, of which approximately only 10 percent is fairly productive. The same small percent of productive land is characteristic of the Sacramento jurisdiction lands. The Indians were found to be existing on two small reservations and on numerous tiny rancherias suitable for residence and for a limited amount of subsistence farming. Restricted resources had driven some of the Indians away, but the majority had maintained their own communities and were living under shocking conditions. The rancheria Indians supported themselves as migrant agricultural laborers, returning to their homes during the months of unemployment. On the two reservations, resources were more extensive and the Indians were making greater use of their land for farming and stock raising.

The biological assimilation that had been so rapid in the early American days of California, when the white population was predominantly male, has practically ceased. Intermarriage is now limited largely to mixed bloods with small amounts of Indian blood. The Indian blood quantum of the rancheria population is approaching stabilization at a degree somewhere between one-half and three-fourths. Although these Indians work in local white economy and have adopted white dress, homes, and speech, they have become only partially acculturated and have not assimilated. They are personally and socially disorganized from being overwhelmed by civilization and from trying to live by the values of two radically different cultures. They are anxious to gain white prestige values and to have their "rights," especially public-school education and the vote. Education in the state public schools has been socially beneficial for the young California Indians. They have accepted it eagerly as a formula for a job and future success, but for those who have returned to their rural homes it has not supplied a beneficial training. Agricultural work is the probable employment for most. There is a demand for trained agricultural workers on white ranches. There are also possibilities for developing agriculture on their own lands and new lands that are being purchased for them. California Indians need far more education for a rural life than they are now receiving, before they can make the best of their rural situation where they prefer to live.

Regional Resources and Education

The Navaho have been the subject of more intensive research in the past few years than any other Indian tribe. Most of this research has been conducted by the Office of Indian Affairs and the Soil Conservation Service

of the Department of Agriculture, in collaboration, and remains unpublished. An integration of the technical and social science studies pointing to educational needs and objectives has been made by Boyce and Fryer (2). This study presented the economic situation of the Indians living in an area three times the size of Massachusetts. The population has increased from around 8,000 in 1860 to about 50,000 in 1940, and is one of the fastest growing groups in the United States. The available land area is limited and is insufficient to support all the people. Severe erosion has resulted from overstocking as the animal population has also increased. The basic economic problem is complicated by the changing culture of the Navaho. Out of this objective study Boyce (1) formulated a plan to educate the adults and children on the reservation for economic competence, thus supplementing the earlier study.

A study of the Navaho problem with especial attention to the role of education was undertaken in 1939 by the Phelps-Stokes Fund (4). The published report described the Navaho problem, the Indians in relation to their land, the administration, law and order, health and homes, the functions of the missions, and education as related to agriculture, homes, and health.

Hulsizer (3) presented an analysis of the cultural background of the Navaho and also the Dakota Sioux and offered an educational program designed in terms of regional needs. In both areas the Indians must depend on their own efforts to live and make adjustments to the constant changes in their life. Education in aiding these adjustments must keep within the framework of the contemporary Indian cultures. These cultures, derived from the old life, have developed on a family and community basis and are still dependent upon the same land environment although not upon the same animal life of their ancestors. The author took the position that it is necessary for the proper education of the children that they have intensive and frequent contact with the environment and communities of their people. It is not only more desirable for and desired by the Indians to be educated on this cultural basis, but contributory to the national welfare. This point of view conflicts with the earlier drive toward immediate acculturation and has not won complete acceptance on the part of all white groups interested in Indian welfare.

Orata (9) spent a year as principal of a consolidated day school offering nine grades of instruction on the Pine Ridge reservation in South Dakota. His purpose was to determine whether the present endeavor to relate the school program to the community needs in an Indian area is sound; the extent to which the training experiences and motivation originating in the school carry over into the life of the community; and how effectively pupils, teachers, and adults of the community may participate in the formulation and execution of the school program. His manuscript, on file in the Office of Indian Affairs, presented transcriptions of the discussions occurring in faculty meetings, community gatherings, and student conferences. He showed in minute detail: (a) how small problems that

arose in the school led to the discussion of basic principles; (b) how this resulted in the adoption of a common objective on the part of staff members; (c) how these staff members undertook individually and collectively to promote these objectives; (d) how students and parents participated individually and collectively in defining objectives and embodying them in their own purposes; and (e) how ways were devised for measuring the success with which these objectives became part of community life.

Continuing Vocational Surveys

MacGregor and Sterner have undertaken a study of the results of the recent vocational education programs in Indian schools for the Education Division of the Office of Indian Affairs. During the past three years the post-school records of the graduates of six federal boarding schools have been studied. The underlying purpose was to evaluate the extent to which Indian schools have been successful in adjusting their students to the surrounding majority whose culture pattern is radically different. As most of the students were found to return directly or indirectly to their original homes, a study of economic and social backgrounds of these reservations was included.

The first study was made of students of Oglala Community High School on Pine Ridge Reservation, South Dakota, and the St. Francis Mission School on the neighboring Rosebud Reservation (7). It was found that 75 percent of the boys never left the reservation and one-sixth of the remainder had left but returned. Eighty-four percent of the girls had remained on the reservation since leaving school. In employment 33 percent of the boys were following their trade training and 33 percent were not. The remainder were unemployed or continuing their education. More significant, 82 percent of all employed boys were working for federal relief or missionary agencies, supported from outside sources. Few girls were employed and the very definite trend for them after leaving school was to marry and manage homes on the reservation. The reservation offered enormous cattle ranges and small subsistence farms, both little utilized by the Indians. The obvious implications of the survey are that specialized training beyond general education for these Sioux should prepare for a modern Indian life in Indian communities based on a livestock economy.

The next survey turned to the California students who had been trained at Sherman Institute, Riverside, California (8). This is a nonreservation school which had a predominantly industrial vocational curriculum. Much attention had been given to placing the better grade of students in southern California industry, and about 33 percent of boys from this school were employed in work similar to their vocational courses. In contrast to Pine Ridge, 75 percent of the boys had not returned home. The girls showed an opposite trend, 75 percent ultimately going back to their Indian communities. While the reservations from which these students

came contained much poor land, a good chance existed to supplement seasonal wage work by running cattle, subsistence gardens, or fruit orchards. As a result of the study, Sherman Institute has now created a valuable basic agricultural curriculum for both its boys and girls. Whether or not they return home permanently or temporarily, they will have a thorough technic for deriving the most from their home opportunities.

In 1939 the survey was carried to Arizona (6). The nonreservation Indian boarding school at Phoenix draws its students from a dozen reservations within the state. Environment, type of economy, native culture, and degree of acculturation differed widely, and accordingly the study and findings were restricted to a reservation rather than a state basis. The backgrounds of history, economics, social organization, and education were summarized for each large southern Arizona reservation. As a group the Arizona reservations have fairly ample resources, without the checkerboarding of white- and Indian-owned lands. They offer the greatest promise for a happy existence of Indian minority groups within white American life. The young people indicate a very real desire to perpetuate and improve it, and they thus reflect the power of the existing Indian life to bring them back, even after years of school influences directing them into different work and to white centers of life.

The most recent survey, still in manuscript, was made among the graduates from Oklahoma who attended Chilocco and Sequoyah Schools in that state, and Haskell Institute in Kansas (5). All three are nonreservation schools. The statistical tabulations indicated some interesting trends. Two-thirds of both boys and girls from the Five Civilized Tribes Area of Eastern Oklahoma have not returned home. Two-thirds of the boys in government employ have regular rather than relief positions. Among girls who did or did not return, there was a wide variation in types of employment rather than a concentration in housework.

The explanation as to why this group of boys and girls do not return home undoubtedly lies in the lack of resources and opportunity at home. The Five Civilized Tribes have been deprived of most of their lands. Recent drought and erosion have added to the hardships of rural life in eastern Oklahoma. On the other hand, easier assimilation or acceptance by Oklahoma whites has allowed extensive and varied employment. The high degree of regular employment in the Indian Service among this group of students has been greatly facilitated by the commercial course at Haskell Institute. The findings for Indians on reservations in middle and western Oklahoma were less clearly defined.

The general conclusion that can be made from these surveys at this time is that where home resources and social life offer an opportunity for Indian graduates, they prefer to return to them. Where resources are not supporting the Indians, young people are driven to move out. The implications of the facts for curriculum reorganization were explored and each study included specific recommendations.

Indian Missions

Strong (10), in a comprehensive study of the relations of government and Indian Christian Missions in the United States, gave considerable attention to the role of missions in the education of Indian children. She traced the development of missionary education from its inception in the early days of the colonies up to the present time. She pictured the growth and development of the government schools and the gradual increase of tension and conflict between mission and government schools, and she placed the whole discussion within the framework of changing social philosophy with regard to treatment of the Indians.

Her conclusions were as follows: "Missionaries were the first to bring education to the Indian people. Its purpose was to civilize them or to teach them the ways of the white man. It has changed very little in objective since then, although it has changed in form and content. Today the Administration is proposing a new type of education—that which develops the personality and the latent powers of the individual and integrates him into his changing social community. If religion is to be operative in the lives of Indian children, then this educational program must have religious resources on which to draw. Are the missionary forces ready to supply this need? Are they equipped to take part in the guiding of expanding life so that all the common experiences of everyday life will have religious significance? This is the challenge which the new progressive education policy of the present administration presents to the Indian missionaries. They have stated that they will welcome the cooperation of the missionaries, but it will be cooperation in this new program. The type of authoritative religious instruction missionaries have so long given children in government schools will be totally inadequate to meet the demands of the new situation. If the missions cannot fill the need of religion in life, then the ancient religions may take up the gap."

Strictly anthropological research has been omitted from this report. Surveys of the type being made by TC-BIA and MacGregor and Sterner for the Indian Office are continuing, and additional work is now in process. Vocational surveys of the territory tributary to the Flandreau Indian School in South Dakota and the Santa Fe and Albuquerque Schools in New Mexico have been undertaken as thesis problems and are still in process.

Under the sponsorship of an interdepartmental committee of the federal government, the Indian Office has undertaken a research project aimed at the development of improved recruitment, selection, and placement of Indian Service personnel. Specifically the project seeks:

1. To devise a paper-and-pencil test of approximately an hour's length to be used as a supplement to the existing Civil Service examinations in selecting personnel for the Indian Service
2. To develop a rating form which will serve as a valid and reliable instrument to measure actual performance of employees (12). This work is still in process. There is an aroused interest in research as bearing on

Indian education and administration which should within the next decade produce a much richer volume of literature.

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INTRODUCTION

THIS ISSUE of the REVIEW OF EDUCATIONAL RESEARCH is the first to deal exclusively with fine and applied arts and commercial education. Previously these subjects were treated in the issues entitled "Special Methods and Psychology of the Elementary-School Subjects" and "Psychology and Methods in the High School and College." However, it was possible for the writers on each chapter to follow rather closely the precedent established for reviewing those studies that have appeared in published form during a three-year period. Thus this issue of the REVIEW covers in general the three years preceding March 1941.

As was contemplated by the Committee when it undertook the task of preparing the manuscript, the fields covered are not clearly defined. The chapter on music includes studies in physics and radio. The chapter on home economics includes home and family living as well as those aspects commonly classified as home economics. The chapter on industrial arts includes what is sometimes called vocational education, industrial education, and national defense. The chapter on commercial education includes business training, clerical work, and office practice. Some of these subject-matter fields show a need for more clearly defined terminology. Yet in spite of this limitation, considerable research has been done which should help to clarify the problems in these fields and to set more concrete objectives for the administrators, the curriculum workers, and the teachers in the classroom.

MANLEY E. IRWIN, *Chairman*
Committee on Fine and Applied Arts

CHAPTER I¹

Commercial Education²

JACOB S ORLEANS

THE FIELD OF COMMERCIAL EDUCATION covers the subjectmatter of book-keeping or accounting, business arithmetic, commercial law, introduction to business, office machines, shorthand, typewriting, transcription, secretarial practice, business English, salesmanship, retailing, the materials of merchandise (textiles and nontextiles), advertising, marketing, and consumer education. In the summary presented here, not only studies in the subjects listed above are included, but also studies that might be regarded as falling under the headings of guidance, curriculum development, professional training, and the like. They are included here because they deal with the professional training of teachers of commercial subjects, with the content of commercial subjects, and with guidance problems of students who have taken commercial work and seek commercial positions.

Through the use of a questionnaire sent to 158 secretaries, Fowler (14) ascertained the amount of bookkeeping training they had had and their need for such training in their jobs. He concluded that every student majoring in secretarial work should have an appreciable amount of work in accounting with actual practice in keeping sets of books. Miller (32) found that in one small community percents of pupils preparing for different types of commercial positions were not in accord with the needs for workers in such positions. Although this study deals with one small community, the findings would in a broad sense probably be true for the country as a whole. Toll (50) determined, through questionnaire and interview procedures, the occupational distribution of various types of commercial positions in Quincy, Illinois; the duties of each position; the training required for each position in terms of special knowledge and skills, the personality traits desirable, and the mastery of subjects other than commercial; and employee deficiencies. He also studied the extent to which each type of skill—shorthand, typing, commercial arithmetic, bookkeeping, and so forth—is used in these positions. Another approach to the curriculum problem in commercial subjects is through the medium of consumer needs. Hardaway (20) determined the extent to which commercial courses contribute significantly to the type of knowledge needed by consumers. She administered a two-hundred item test to over six hundred seniors in the El Paso, Texas, schools. Her general conclusion is that the pupils who have had an appreciable amount of work in bookkeeping, commercial law, and economics are better able to deal with consumer problems than those who have had less or none of these subjects.

¹ This chapter was prepared with the cooperation of Walter Cassidy of Fordham University, Baird Parks of the College of the City of New York, W. Irvin Pearman of the College of the City of New York, Arthur H. Sutherland of the College of the City of New York, and Herbert A. Tonne of New York University.

² Bibliography for this chapter begins on page 373.

Coover (11) reported results on a questionnaire comprising business and economic generalizations rated by thirty persons. Mulvihill (36) studied the overlapping between high-school and college commercial courses. Robertson (43) measured the presence of business and economic concepts among ninth-grade pupils. Her conclusions are in terms of differences between age and sex groups and parental occupation. Her data provide the possibility for analysis in terms of content. Graham (17) conducted a nationwide survey to determine the extent of cooperative retail training programs for high-school graduates and the nature of the programs, and concluded that the trend in the development of such programs under the provisions of the George-Deen Act is a significant one. An integration of results of such studies would be desirable as a basis for determining the content of commercial courses to replace the original authoritarian determination of textbook writers.

Guidance of Commercial Students

The primary emphasis on guidance in the field of business education continues to be on the problem of technics for discovering the best methods of job placement and follow-up, and for determining the adequacy of the training given as a basis for curriculum and guidance evaluation. The study by Levy, Nunes, and Berlin (28) concluded that high-school graduates who have taken high speed and secretarial courses while in secondary school are securing remarkably satisfactory job placements. These jobs are obtained by many different procedures and represent an argument for expanding rather than limiting shorthand training in the secondary school. Schloerb (46) found, on the basis of interviews with employers and on the records of various placement services, that there are more young persons seeking white-collar jobs than there are jobs available; and that employers wish schools to emphasize the development of character traits rather than the mastery of skills, but that they believe the fundamental skills need to be better taught in schools. Wein (54) came to these same conclusions and stressed the need for a greater insistence upon job standards in the school. Pavan (40) evaluated the study of the occupational commercial aspects of the WPA activities of Philadelphia high-school graduates. This comprehensive survey indicated that over 90 percent of the commercial graduates actually secured positions as office workers—agreeing with the point of view expressed by Levy, Nunes, and Berlin (28) in their study, which showed that job success of business education in the high schools is substantial and that 80 percent of these graduates of business curriculums had used some part of their vocational training since graduation. The age most commonly accepted by businessmen as desirable for entrance into business is eighteen.

Trytten (51), in his survey of hiring methods sponsored by the Personnel Group of the National Retail Dry Goods Association, indicated that more than half of the employees hired by department stores have some grievance

against the company by the time they are hired. The study indicates techniques for overcoming or at least reducing the extent of these grievances. Brummett (7) noted, as a result of her follow-up, that the graduates of a particular high school found the following subjects most helpful in order of value: typing, shorthand, commercial arithmetic, bookkeeping, business teacher training, commercial law, and commercial geography. The graduates suggested that training be given in office machines, business English, and salesmanship, among others. Westman (55) based his study on the follow-up of graduates of the Duluth Central High School in order to study occupational classification and the relation of scholastic ability to occupational status. A far larger percent of the commercial graduates, as opposed to the noncommercial graduates, felt that their schoolwork trained them for their current positions. A large percent of the students expressed dissatisfaction either with the academic training they had had or with commercial training that was inadequate or that prepared for overcrowded fields. There is opportunity for a compilation of the numerous follow-up studies undertaken in business subjects, and a nationwide and thoroughly authenticated body of information would be of great use in bettering the achievement of the guidance functions of the school.

Surveys of Business Education

Fundamentally significant in this area of research in business education is a state by state compilation of the certification requirements for business teachers in the United States by Brewington and Berg (6). This compilation gives specific requirements for teaching various business subjects, general background and general business education requirements, practice teaching, business experience, and various other stipulations set up by the several states. Judgments are rendered upon carefully established criteria about the present certification requirements. Brewington (5) also set up a detailed statement of certification requirements of business teachers in Illinois. Turrille (52) and Thompson (49) studied the status of commercial teacher training in Nebraska and in Illinois, respectively. Tarkington (48) surveyed employment conditions for commercial teachers in the United States. According to the state superintendents and commissioners in twenty states, the supply is less than the demand; in nineteen states the supply approximately equals the demand; and in nine states the supply is probably greater than the demand.

Shorthand, Typewriting, Transcription, and Office Practice

Surveys of the transcription errors of high-school secretarial pupils show that a lack of knowledge of the rules of grammar, punctuation, and capitalization, plus an undetermined amount of carelessness, is responsible for many of these errors. Williams (56) analyzed the errors in 15,000 transcription papers of 256 students. Errors in punctuation alone accounted

for 78 percent of the aggregate number of errors. Olenbush (38) made a similar survey in which mailable and fairly complete letters transcribed from shorthand were rated as to errors in form and arrangement, usage of grammar, spelling, punctuation, and the like, and concluded that there should be more collaboration between English and business subjects, and that pupils be chosen for transcription courses on the basis of clerical ability tests.

The relative abilities of bright and slow pupils in learning typewriting were investigated by Platt (41) who, in a study of 107 unselected pupils, reported that pupils with high IQ's make excellent or good typists. No pupils with low IQ's make good typists; no pupils with high IQ's make poor typists. The average pupil may be a good or a poor typist. Mitchell (35) made a similar analysis of the abilities of pupils of low IQ (73 to 106) to learn shorthand. She studied the work of those pupils who strongly wished, despite all discouragement, to take up secretarial work. Her observation of special classes of such pupils led to the recommendation that every large shorthand department institute at least one slow-moving class which would spread one year of work over three terms, and that only the more mature pupils be allowed to enrol.

Lawrence's survey (27) of the secretarial courses offered in the forty-eight member institutions of the American Association of Collegiate Schools of Business provided detailed information about the nature and amounts of the offerings and credit practices. He urged research to determine course boundaries, standards of achievement, evaluation, and the like. Malueg and Snyder (29) in their study of drop outs from college courses in shorthand found that of an original college group of 370 beginning students in shorthand, only four of those rating below the 25th percentile in the Thurstone Psychological Examination succeeded in completing the third semester of shorthand. They recommended that students who are inferior in psychological test scores, the Iowa Silent Reading Test, and high-school marks be discouraged from entering shorthand courses. Eyster (12) reported the results of predictive procedure in which mental rating, average English marks, average of all other marks, score on Hoke Prognostic Test of stenographic ability, and a subjective personal trait rating were used to prognosticate success in shorthand.

Merrick (30) in a study of 4,650 pupils in typewriting classes reported that mental age is not a significant factor in typing success as measured in terms of gross and net words per minute for pupils of this level. She defended a seventh-grade typing course not only on the basis of typing skill required but also on the basis of the English that the pupils learned. She concluded (31) that the learning of typewriting should include practice in composing as well as in copying. On the basis of the work of twenty-nine seventh- and eighth-grade pupils she found that quality of composing usually surpasses quality of copying at the same or higher rates. A study by Watson (53) indicated another type of relation between English and secretarial work. Watson found that practice in composing on the type-

writer resulted not only in an increase of ability to compose on the typewriter but also that pupils were able to compose faster in longhand after the typewriting practice. The increase in amount of material written by an experimental group of high-school boys and girls ranged from 43 percent to 298 percent over their initial rates. No relationship was observed between the rate of typing and the quality of expression, nor was any relationship found between the mental age or IQ and the quality of expression.

The variety of equipment used in high-school office practice courses and college secretarial training was reported by Sutton (47) and by Freeman and Melofsky (15). Ogle (37) reported a lack of uniformity in college courses of study and standards required for work. In 93 percent of the fifty-four colleges that she surveyed, credit for secretarial work was given toward a college degree in the case of all machines other than the typewriter. Although training in transcription was given, there seemed to be more emphasis upon the training of supervisors than on the actual operation of the machines. Only 25 percent of the colleges reported training in office machines other than the typewriter. Freeman and Melofsky reported a similar lack of uniformity in a follow-up study of high schools in Westchester County. Only 75 percent of the forty-three high schools having commercial departments offered courses in office practice. The aims of the courses were to acquaint pupils with various types of office machines, to study clerical and office routines, and to develop marketable skills. The topics taught ranged from typing, filing orders, pricing, billing, telephone work, receiving and shipping orders, mailing, cash register, accounting, and so on, to business ethics.

Ogle (37) and Robinson (44) showed attempts to make conditions of secretarial courses approximate those found in offices or those that employers wish to prevail in offices. Ogle set up a classroom situation in which each student's activities approximated those of a secretary. As a result of the experiment, Ogle stated that the planning of class work on this basis improved the initial efficiency of a secretary. Robinson (44) approached the same problem through a questionnaire study to determine dictation methods in business offices. Business executives and experienced stenographers urged the schools to give more training in the fundamentals of business, to teach fewer courses more thoroughly, to give more training in meeting the public, to provide actual training in using the telephone, and to provide other items dealing with the development of personality

Commercial Arithmetic

A summary of research in commercial arithmetic presents the obvious difficulty of distinguishing between just arithmetic and commercial, or business, arithmetic. Studies dealing with arithmetic knowledge at the high-school and college level as well as studies dealing more directly with the solution of business problems by means of arithmetic were deemed

pertinent to this field. Cassidy (10) justified the inclusion of over one hundred items in the commercial mathematics course on the basis of extensive analyses of commercial mathematics textbooks, accounting and bookkeeping textbooks, theses, civil service examinations, sales promotion literature of business machine companies, national trade journals, and data provided by certified public accountants. Roach (42) determined, after interviews with druggists, doctors, lawyers, farmers, and other professional and tradespeople, the kind of arithmetic that can make the course concrete and that includes problems that will furnish a basis for practical living. Given (16) claimed that a maintenance program should be developed in the secondary schools which would give greater opportunity for the functional use of arithmetic, and that arithmetic fundamentals become more meaningful to the student when he must master them in order to solve an immediate problem. Kinney (25) discussed suggested objectives for business arithmetic based upon a survey of large and small business establishments as to arithmetical calculations performed.

Bramhall (3) found that a good method of teaching problem solving is to give pupils many opportunities to solve problems their own way and at their own speed. Braverman (4) noted that ninth-year algebra improved the arithmetic abilities of students. Casner and Nyberg (9) pointed out that high-school seniors with seven to eight terms of mathematics averaged 4.44 problems out of 8 correct, while those with none or one term averaged only 1.29 correct. Their results were based on a test of eight problems given to 212 high-school students. The authors regarded all the results as poor and recommended that all other departments of the high school cooperate with the mathematics department in providing training in dealing with practical arithmetic problems. Mitchell and Nemzek (35) administered an arithmetic test to over five hundred high-school seniors including students who had a year of algebra and a year of commercial arithmetic and a group who had had several academic courses in mathematics beyond algebra. The latter group did better on the arithmetic test, leading the authors to the conclusion that students who have had high-school commercial arithmetic do no better on an objective arithmetic test than do matched students who have not had arithmetic in the high school as a separate course.

Orleans and Saxe (39) assumed that certain types of problems should be part of the commercial arithmetic taught in the secondary school and analyzed the learning of such problems for a group of students in a professional business college. They found that although the group of students was highly selected the knowledge of business arithmetic was comparatively meager. A detailed analysis of types of errors showed that few were computational. The major difficulties were found to be those related to the problem-solving procedure. The authors concluded that the problem-solving difficulties result from rote learning and a consequent lack of development of a reasoning process.

Distributive Trades

Holman (22) reported on a part-time cooperative program in Mason City, Iowa, in which students who worked part time in distributive occupations were trained in the field of distribution and their success in their jobs evaluated in comparison with graduates not so trained. She concluded that such a cooperative training program fills a need in the community and increases the possibilities of job getting as well as salaries. Wissig (57) reported an analysis that attempts to answer such questions as the following: To what extent are employees trained by individual business concerns? What is the nature of the training programs used by specific concerns? The analysis provided information concerning the nature of the training staff, the details of the programs, methods and materials, and supplementary activities.

Consumer Education

Kent (24) analyzed and appraised consumer education programs of sixty high schools located in various parts of the country. Consumer education criteria were set up and used as the basis for the appraisal of the sixty programs. The appraisal indicated that "if the student gets information which results in modifying and strengthening his concepts concerning needs, desires, tastes, and attitudes, it is only indirectly through the study of other allied subjects."

Despite the rapid and extensive development of consumer education, there is little published research in this field. There has been almost no research evaluating the content, outcomes, and methods in any of the commercial subjects as a basis for developing sound and effective methodology. Considering the extent of commercial education in the United States today, its rapid development, and the continued increase that is obviously to be expected, it would not be out of place to point out first the desirability of publishing completed research in this field, second, the limited amount of the research so far done (judging by what has been published); the need for integrating significant completed research; and the need for a great deal of significant research in the many phases of commercial education.

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CHAPTER II

Art¹

RAY FAULKNER and EUGENE MYERS

INCREASING EMPHASIS in the past few years has been placed on relating instruction in the arts to other subjectmatter areas and, more particularly, to life needs. That art should function in all school and life activities was made evident by the Owatonna Art Education Project (75, 77) in which the art needs and interests of the people in a typical community were studied, and a school art program was developed primarily in terms of these needs. Faulkner (18, 19, 21) reported similar findings from experimental work in organizing art instruction at the college level. He concluded that the primary need for art is as it occurs in everyday activities, such as those relating to the home, the community, commerce, and industry. Whitford (73), in discussing recommended practices in school art, observed that there is a growing desire today to provide all pupils with a common, integrated body of habits, skills, attitudes, appreciations, and functional knowledge that will enable them to adjust to the dynamism of the present culture. A concern for the development of the whole child and for the development of complete and integrated personalities, such as that outlined by the Committee on the Function of Art in General Education (65), has stemmed in part from organismic psychology. The members of this committee concluded that the most important concern of art education is the growth of personality, that art experiences are the right of every person, and that art should be an inherent element in the total drama of life.

Integration of Art and Other Subjects

A statement (1) prepared on secondary education by general educators illustrated the growing realization that esthetic experience is vitally related to all other experiences of the learner, and should be made generally available to high-school pupils as well as to elementary-school pupils. MacDonald (49) further emphasized the arts as important factors in education at the secondary level. Whiting's survey (74) on the integration of art with various high-school subjects led to the conclusion that art should be considered as one phase of the education of all high-school teachers. D'Amico (12), writing about high-school art instruction, indicated the desirability of meeting two requirements: the specific needs of each individual and the integration of art with the general education of the student. The method should be flexible to encourage solutions to art problems in a variety of ways and mediums; individual to encourage individual choices, habits, and abilities; and coordinating to motivate and

¹ Bibliography for this chapter begins on page 383

clarify meanings beyond the initial art experience to relate art interests with other areas. Schultz (69) discussed in detail the program undertaken at the Francis W. Parker School to bring about a more thorough understanding of the artist and his relation to society. Student committees selected exhibitions of original works by Chicago artists. Schultz pointed out that the experiment helped clarify the problems of the artist as a member of the social group, and that it led to a new and vitalized interest in the arts. Quin (66) discussed a progressive, flexible, integrated program of art at the secondary level.

Factors in Teaching Art

At the college level, Cowling (11) reported an experiment with an introductory art course. A semiprofessional approach to art, and an approach based on the individual conference method, were completely or partly discarded for a method based on individual conference plus a running core on the study of art structure. Another experiment (2) probed for ways to improve college student receptivity in dealing with art appreciation and ultimately led to a laboratory approach. Faulkner (19), in discussing course methods, has found that the value of any method of art instruction depends less on the method itself than on the details of how that method is used. Regarding the service function of the art teacher, members of the Committee on Art Education for the National Commission on Cooperative Curriculum Planning (61) concluded that it is not a matter of "service" which is given by a department, but something so important that without it the form would be incomplete. Their consensus was that the art staff should be composed of qualified teachers in art who have sufficient background in general education so that they can understand and interpret the work done by other departments. Preston (64) surveyed the time allotments for art in the public schools in fifty-two midwest cities. In the first three grades she found a range of from 25 to 200 minutes per week with a median of 100. In Grades IV, V, and VI, she found a range of from 25 to 175 minutes per week with a median of 90.

Radio and museums—Several experiments have been tried in art education by radio, and more emphasis is being placed on utilization of the art museum. Howell (34), in evaluating the Cleveland public-school experiment in art appreciation by radio, reported the following outcomes: increased enthusiasm for works of art and nature; increased interest in visiting the art museums; enrichment of vocabulary; recognition of art as a factor in life; improvement in taste; and stimulation of creative effort. Along with the radio programs other sensory impressions were afforded the children through the use of colored slides, color prints, and various supplementary materials. The success of the venture was largely attributed to the excellent follow-up means that were employed. Another study (68), based on the results of a questionnaire survey of the audience of a broad-

cast course in art appreciation, indicated that any appreciation of art that was developed was superficial. Although listeners reported that they enjoyed the programs and intended to do something as a result of the instruction in art they had received, they actually did very little. In a discussion of the role that the museums can play in education, Davis (13) reported that art museums have been experimenting and searching for a closer relation with the school and community. His report contained descriptions of a number of specific educational programs being conducted by museums today. Foley and Anastasi (25) reported on a gallery developed under WPA auspices, the purpose of which was to stimulate the creative and appreciative sides of children's artistic natures by providing exhibits of work done in art projects, and by maintaining classes for children. Levy (44) prepared a guide covering opportunities for art training in high schools, colleges, universities, art schools, and WPA art classes in New York City.

The Training of Teachers of Art

Ziegfeld (75) pointed out that present trends appear to be leading away from the platoon system and departmentalized instruction at the elementary level, with the result that more classroom teachers will have to assume the responsibilities for teaching art. The report offered a number of specific recommendations for teacher-training institutions. Hager and Ziegfeld (29) revealed a lack of agreement among teacher-training groups as to what should be included in the education of an art teacher. They pointed out that the great variation in the amount of work required indicated that very differently equipped teachers are being produced to fill the same kinds of positions. The study also revealed a growing tendency to broaden the preparation of art teachers to include considerable work in English, social science, and natural science, as well as in art. Horn (32) pointed out that teachers colleges tend to give too few hours to art courses in proportion to the requirements in art education, and that art schools tend to give too many such hours. He concluded that one-third of the students' time devoted to studio courses appeared reasonable.

Children's Preferences

Four studies of preferences by Lark-Horovitz have considerably expanded our understanding of what qualities in art interest children, and as such are of value in planning school art programs. The first (38), dealing with preferences of picture subjects in general, showed that children have definite preferences, that there is a sharp difference between very young boys and girls which diminishes as they grow older, and that children with marked art ability tend to notice design and color more than do typical children. The second study (39), dealing with portraits, revealed again that children have marked preferences for some pictures, that boys

prefer portraits of men while girls prefer those of women and children, and that the basis for the preferences is the subjectmatter interest of the person portrayed. The study (40) of textile pattern preferences showed that—with the exception of older, especially gifted children—abstract designs are of less interest than more or less realistic designs of objects close to the children's interests. A comparative study (41) of white and Negro children gave evidence that the two groups differ widely in their preferences for pictures and portraits but are quite similar in their reactions to textile patterns.

Developing Creative Tendencies

The progress of art education depends to no small degree on the understanding of creative activity held by teachers, and in this area a number of recent studies are of interest. Levey (43) gave a systematic review of many theories of creation and stated his belief that creative activity is an individual, more or less unconscious, process of transcending recurrent mobile depressions. This conclusion was challenged by Hough (33) who placed emphasis on tradition and on the social background. Pickford (63) admitted that the importance of the Freudian process of sublimation is important but saw the artist in relation to his social culture. Munro (59), in a comprehensive discussion of creative activity and its educational fostering, pointed out the importance of both individual and group factors.

Several specific phases of creative activity have been studied. Lowenfeld (45), working with visually handicapped subjects, found that artistic expression was not necessarily visual in origin, and differentiated between the visual and haptic types. McCloy (47) investigated creative imagination and found among other results that creative ability seemed to bear little relation to chronological age beyond twelve years. McCloy and Meier (48) observed that students with art training have superior creative imagination. McCloy (46), studying passive creative imagination, found a tendency on the part of his observers to prefer calm, peaceful pictures; to dislike oppressive, unnatural pictures. A questionnaire study by Merry (54) showed that the characteristics most often regarded as comprising art talent are love for and interest in art; ability to distinguish the good from the poor in line, value, and color; ability to portray visual images graphically; and creative ability. In a final summary of a ten-year study of a special ability, Meier (51) concluded that art ability depends on six conditions: manual skill or craftsman ability, energy output, and general esthetic intelligence which are primarily hereditary; perceptual facility, creative imagination, and esthetic judgment which are primarily dependent on environmental factors.

Mitchell (55) pointed out that the child's self-confidence and self-direction will be strengthened when he finds and solves his own problems. Boas (3) discussed ways she had found successful in fostering art activity and clarified the problem of standards for teacher and pupil. A workshop

approach to art education, based largely on design, was discussed by Pearson (62). For the elementary level, Cole (10) reported that success in releasing the creative ability within the child was achieved when the teacher established a genuine rapport with the child and that the teacher must evolve her own approach and means of presentation from her own background of teaching experiences and understanding. Meier (50) pointed out that the belief that any child will create if left alone lacks substantiation, but that children will respond to competent guidance and in individual cases will show surprising gains. An evident conclusion in several studies (10, 50) was that nothing is created except from the experiences of the person and that, since children vary in the richness, variety, and clarity of their experiences, there will be a variation in the readiness and facility with which expression becomes possible. Mundell (57) sought to discover if any change would result in the art production of intermediate-grade children if they were given a series of lectures on art principles conceived by adults. Two matched groups of fifth- and sixth-grade children were given art training, and one group was also given lectures. Results showed that neither the children's esthetic judgment nor their production was influenced by the lectures.

Appreciative Activities

A number of investigations of appreciative activities have given new data on this phase of art education. A psychological description of the esthetic experience by Hevner (30) stated that it is usually affectively toned and is differentiated from other mental activities by its dignity, intensity, and unity. She emphasized that it is an active process and that training is necessary. Read (67) placed emphasis on the unity of esthetic emotion. Munro (60) wrote that what children like is of less importance than why they like it and how they came to form their judgments. He pointed out that, although there are many varieties of esthetic response, the general components appear to include visual perception, imagination and understanding, response to associative content, empathy, and knowledge of art.

Brighthouse (6) found that mature esthetic apperception is dynamic in those persons trained in art and that they show far greater mental activity of a carefully directed kind and are more directly concerned with compositional factors than are subjects with little or no art training. His results indicated that artistically untrained adults show only slightly greater esthetic maturity than children, a plateau apparently being reached at ages ten to eleven. Gunthorp (28) found that esthetic maturity, as judged by adult standards, is related to high scholastic attainment, training in art, and high cultural level.

Sisson (70) found that verbal suggestion is a factor in determining art judgment. Kellett (36), investigating the essential bases of unity in graphic art, found that visual clarity of organization or unity seems

relatively unimportant in determining the hedonistic choices of artistically untrained observers, in spite of the fact that unity is placed high in most scales of esthetic values. She concluded that "objective unity is not a first determining factor in pleasure derived from works of art," and that unity seems to be a function both of the art object and the observer. Clair (9) found that training in two-dimensional design tends to block an appreciation of three-dimensional composition, but that a searching, analytical attitude does not hinder esthetic pleasure. Cahalan (7) reported that esthetic judgments within a period of a year were generally consistent for the same subjects, with art students being more consistent than nonart students and those making high scores tending to be more consistent than those making lower scores. Eysenck (17) found evidence for a general, objective factor of visual esthetic appreciation which was independent of teaching, tradition, and irrelevant associations. Dewar (14) also found evidence that a general factor is influential in determining art appreciation.

The problem of evaluating art products, closely related to appreciation, is not only central in most programs of education in the arts but is also one of great complexity. Gilbert and Kuhn (26), in the first comprehensive history of esthetics written in English, traced the development of esthetic theory from early times to the present. Boas (4), treating the problem philosophically, discussed *instrumental* and *end* values. Greene (27), working closely with artists and art critics, gave a conservative, scholarly account of matter, form, and content in art. Evans (16) attempted to account for tastes primarily in terms of introversion-extroversion, thus breaking with the typical historical method. Some of the more philosophic treatments of value were summarized by Faulkner (22). Munro (60) related the philosophical and psychological methods and findings.

That art judgment is specifically related to the field of art being judged was the report of Faulkner (19) who found low, positive correlations between scores on different tests of art judgment. A similar finding was reported by Dewar (14). As reported in these two studies, the relation between scores on single tests of art judgment and tests of intelligence also gave low positive correlations. However, Dewar reported a correlation of .48 between the average on four tests of art judgment and intelligence. From these data it appears that the existing tests of art judgment measure a type of behavior relatively independent of general intelligence, and that the various tests either do not measure the same ability or measure different aspects of it. Dewar reported evidence of a single general factor but with some indication of specific factors.

Measurement of Art Abilities

In contrast to the earlier tests which were for the most part general in nature, many recent tests are more specific. Varnum (71, 72) developed and published a selective art aptitude test for the "specific advisement of young people interested in art and desirous to become artists and design-

ers" (72) Accompanying the test is a list of one hundred and sixty-one vocations and professions which show the expected scores on the test for persons in each occupational field The author claimed that training does not change or influence the scores, and that preliminary usage had shown high prognostic value. If Varnum's claims are justified, a much needed instrument will have been made available to guidance counselors Based on a thorough analysis of some ten thousand drawings of children, Lark-Horovitz, Barnhart, and Sills (42) prepared a graphic work-sample diagnosis of the drawings of children. Feeling that scales and judgments of children's work based on adult judgments and involving *a priori* standards were not valid for the diagnosing of children's work, the authors established "an empirical basis for evaluation on the extent to which certain characteristics of the drawings are typical of each age." (42) Although the instrument in its present form is not easy to use, it marks a forward step in theory and practice.

Two unpublished tests also hold considerable promise. Paul Diederich developed a test for use in high schools called *Seven Modern Paintings*. In it, the responses of the subjects are rated in relation to the responses of other high-school children. Bruno Bettelheim prepared a test in which the subject selects, on the basis of similarity, pairs from forty reproductions of paintings. Besides the esthetic sensitivity thus displayed, the test reveals much about the subject's personality and interests. This is also true of Diederich's test Faulkner (20) devised pictorial tests to measure judgment of paintings, sculpture, architecture, and industrial products; congruity in house design and house furnishings; and verbal tests in art principles, art history, and attitudes toward art. In a statement on evaluation in a general art course, various technics useful in measuring students' progress were discussed.

Summary

Although in the past the arts have received somewhat less attention, particularly of a scientific nature, than most curriculum areas, there is a salutary tendency to take stock of past work and to consider what should be done in the future. The Fortieth Yearbook of the National Society for the Study of Education, entitled *Arts in American Life and Education*, gave a comprehensive picture of the present status of art education, and the articles by Munro (58, 59, 60), Meier (52), and Faulkner (23) pertain specifically to research Moore (56) gave a statement of research in art education, and Chandler and Barnhart (8) prepared an extensive bibliography.

Future progress depends to a large extent on two factors: defining problems which need investigation, and developing suitable methods In regard to the first factor, Hilpert (31) listed a number of studies which need to be made, Doucette (15) reported an outline of research studies in art education, and Faulkner (18) proposed a research program in art

appreciation There is need for careful study of broad objectives and policies as well as for experimental studies of types of courses needed at different levels and for different types of schools, on how such courses may be taught most effectively and how they should fit into the school program Studies of children's preferences, individual and group differences, and the learning process in art are needed. In regard to the second factor, Koffka (37) emphasized that such problems have both objective and subjective characteristics, and Faulkner (24) stated some of the basic principles on which research in art education rests. With the increased interest in graduate work in art education such problems will undoubtedly receive attention.

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CHAPTER III

Home and Family Life Education¹

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MORE THAN TWO HUNDRED STUDIES in home economics education have been reported as carried on by graduate students and faculty members during the past three-year period. Those discussed in this chapter represent only a small percent of these, but since practically all of them are abstracted in *Notes on Graduate Studies and Research in Home Economics and Home Economics Education* (6), which is published annually, it seemed desirable to discuss only those investigations which have been reported in published form and to confine them largely to studies at the elementary- and secondary-school levels. Most of the materials represent research investigations, although some have been included which present significant points of view or trends in educational thought or describe projects under way which seem likely to produce significant results when they are completed.

Instruction as a Part of the Basic Curriculum

The striking similarity in the conclusions and recommendations made in publications sponsored by several major educational organizations in 1941 (3, 24, 26) seems to indicate that an important change is taking place in the attitudes of teachers and administrators regarding the desirability of incorporating those materials dealing with home and family living into the curriculum basic for all rather than restricting them to special groups of girls. That such instruction is needed was pointed out by Spafford (39). She cited the opinions of administrators, teachers, and others regarding the value of homemaking education for both sexes and stated her own philosophy regarding the potential contribution of home economics toward improving personal and family living. Bell (8) recorded the results of interviews with 13,000 adolescents in Maryland and drew similar conclusions.

Family Living and Our Schools (26) presented the work of a joint committee of the Home Economics Department of the National Education Association and the Society for Curriculum Study. Reasons for frustration and confusion both among children and adults were enumerated as well as the folly of overevaluation of the intellect and underevaluation of the emotions, of undue stress on either academic achievement or vocational knowledge and skill, and of allowing the attitude to develop that homemaking and child rearing are menial tasks which lack social value and significance. Education was considered to be a means for helping people to develop their personalities and to realize their hopes and desires in

¹ Bibliography for this chapter begins on page 395

marriage and in the rearing of children, as well as for transmitting cultural patterns and values. Coeducational study of real problems of family life was advocated, in which schools, homes, and communities cooperate to help individuals learn to satisfy emotional needs and to develop desirable relationships with others. Suggestions were offered regarding what should be done and illustrations were given of what was being done at all levels in the schools to develop such a program and to educate teachers to carry the responsibility for promoting such a type of education.

Education for Family Life (3), the 1941 yearbook of the American Association of School Administrators, stated that "a practical, realistic program of education for home and family life must occupy an important place in the educational services offered by the schools," and recommended that such instruction become a part of the basic curriculum, that it deal with actual home living problems, and that schools attempt to eliminate physical and emotional strain among children and to remove restrictions against marriage for women teachers. The appendix included references and organizations furnishing materials or services useful in family life education. Folsom (24) expressed the point of view of the American Youth Commission in saying that the "highest purpose of the movement for family life education . . . is to cultivate the faith that human life is worth living and that it is worthwhile to make it better." He discussed what needs to be done to accomplish this and described what was being done by schools and other agencies in many communities.

Many schools have developed instructional units for teaching personal and family living as a part of the basic school curriculum. Among the most interesting programs are those in Aberdeen, South Dakota (39), Denver (9, 20, 39), Frontenac, Kansas (35), Houston, Texas (39), Los Angeles (32), Menomonie, Wisconsin (39), Oakland, California (22), and the University School of Ohio State University (2, 39). Bristow (12) recommended the organization of an advisory committee to link school and community more closely, after she had obtained the opinions of parents in two urban and two rural communities regarding the home-making needs of boys and girls and the purpose and relative importance of different aspects of homemaking instruction.

The need for home and family life education is widely recognized, although how and by whom it shall be taught is still an open question. That home economists have an important part to play is evident, but a really effective program seems to require cooperative effort of various groups. The teaching personnel and available agencies in a community, and the groups for which instruction is to be offered, will probably determine what plan of cooperation will be most effective.

Curriculum

Under the sponsorship of the Southern Association of Colleges and Secondary Schools, a study was carried on in Montevallo, Alabama (40),

which investigated the age distribution of junior high-school students, family patterns, occupational levels, housing conditions, homemaking practices engaged in by different family members, and their interests and leisure-time activities. The findings tended to corroborate those obtained in similar studies in other communities, although the investigation differed from the typical study in that information was collected from boys as well as girls and more than the typical number of them came from homes on the highest socio-economic level. Such investigations furnish information which may be useful in determining curriculum content which is likely to meet the needs in the local situation.

A group of teachers working on curriculum revision in St. Paul, Minnesota, centered attention first upon the sort of people they hoped would emerge from the schools. Consequently the tentative course of study published by the Department of Education (15) described a well-adjusted person and listed the objectives believed most likely to contribute toward developing such a person. In the same course of study, the authors listed those items which the majority of 3,500 students, Grades VII-XII, from nine states, stated represented what they wanted to learn in school. The objectives checked almost universally by these adolescents were those relating to learning acceptable behavior, presenting a good appearance, developing independence, breaking bad habits and forming good ones, making and keeping friends, and getting along with parents. So many objectives were checked by approximately the same proportion of students at the different grade levels that they should probably be regarded as ultimate goals. It was recommended that the suggested activities to help students progress toward each objective be considered as a reservoir from which to select those which seemed most appropriate in the particular situation, rather than that they be assigned a definite grade placement.

The Consumer Purchases Study, conducted under the direction of the Bureau of Home Economics and the Bureau of Labor Statistics, collected data which are likely to have a marked influence upon home economics curriculums in both secondary schools and colleges. Data procured from 300,000 urban and rural families furnished authentic information on family composition, income, and patterns of consumption. The findings have been published in a series of government bulletins (29, 33, 42, 43, 44).

A Study of Prerequisite Sciences and Certain Sequent Courses at the University of Minnesota (13) differed from other studies of prerequisites in that it covered a longer period of time, involved a larger number of cases, and followed the same students through prerequisite and sequent courses. The results showed that the student mortality in elementary science courses can be markedly reduced when the curriculum is made more flexible and more effective guidance is given; that laboratory experience is not essential for students to learn basic science concepts and understand their applications; that such learning may be accomplished in consid-

erably less than the typical time allotment, and that achievement in sequent courses is little affected by the type of science background.

A joint research project of Pennsylvania State College and the Pennsylvania Department of Health, dealing with 225 children in two urban communities, was reported by Lowther (30) who found that there was need for improved nutritional status in a considerable proportion of the children at all economic levels, although at the lowest levels there was the most acute lack of protein, calcium, Vitamin A, and Vitamin B₁. The groups with the higher nutrient intake tended to show the higher ratings on the physical examinations, and their socio-economic level tended to show a positive relationship to nutritional status, skeletal maturity, and darkness adaptation, but little if any relationship to weight, dental rating, posture, hemoglobin, or other physiological characteristics. The author proposed three plans for handling noon lunches and specified the amounts of calories, protein, minerals, and vitamins which would probably be required to remedy the dietary inadequacies discovered.

Siebert and Larson (38) described the effects of nutrition clinic contacts and noon rest periods on forty undernourished children in St. Paul, Minnesota. Evidence was collected by means of analysis of health records of nutritional status and reports of medical examinations given in the fall and again eight months later, and by home visits, the collection of teachers' opinions, and controlled observations made during the noon lunch. Scholarship had improved in half and posture in two-thirds of the cases between fall and spring; there was a notable increase in the consumption of milk, fruit, and vegetables and in the overcoming of food dislikes; and almost all children showed improved appetite and table manners, better sleep habits, and a reduction in fatigue, colds, and excitability.

Present Status of Secondary-School Instruction

Home Economics in Public High Schools (23) reported a nationwide study made by the U. S. Office of Education of the status of home economics. It supplied information regarding the extent of offerings in communities of different sizes, the time allotment, the percent of each sex enrolled in home economics classes at different grade levels, and the differences in the breadth of the program in schools which received reimbursement from federal vocational education funds and those which did not.

Effectiveness of School Instruction

Three investigations made recently have attempted to compare what high-school students learned incidentally about certain subjectmatter and what they learned when they received specific school instruction. Banks (7) and Frost (25) dealt with the various aspects of content in home eco-

nomics classes, Banks being primarily concerned with attitudes and Frost with information; and Bingham (10) dealt only with a unit on nutrition taught in classes in biology, in which he measured changes in attitudes, information, and the ability to apply it in evaluating advertisements containing statements regarding nutritional values. Although these studies differ in many respects, certain comparisons may be made with respect to the methods of investigation employed and the findings. Bingham utilized only about a fourth as many cases as did Banks and Frost in their joint study, and his test battery showed somewhat lower statistical reliability than did theirs; but Bingham's findings are unquestionably more significant. In the first place, the technics he used to insure validity in his test items were distinctly superior since his tests were set up in preliminary form, tried out, the discrimination of items determined, and the tests revised before they were used in the actual experiment; whereas none of these procedures were employed by Banks or Frost. Bingham determined the equivalence of his experimental and control groups in terms of their means and standard deviations on a pre-test, while studies of Banks and Frost merely assumed that their control and experimental groups were equivalent because they had selected the samplings to be representative in terms of geographical location, type of school, and proportion of school enrolment.

Bingham collected a variety of types of evidence, in addition to the scores on pencil-and-paper tests, such as descriptive statements from parents, students, and teachers; Banks and Frost used only pencil-and-paper tests, despite the fact that Frost assumed she was measuring certain home-making skills. It is unfortunate that Bingham did not describe more fully the types of experiments carried on in the biology classes and the other testing technics employed, and that he did not devise some means for checking on the dietary practices of the students before and after instruction, other than the subjective statements made by or about certain individuals. Also, the reader who demands rigorous statistical treatment of data may not approve of the analysis and interpretation Bingham made of the respective gains made by the control and the experimental groups and may criticize the use of a control group apparently as an afterthought instead of as an integral part of the experiment. Nevertheless, the loss or the relatively insignificant gains made by the groups who were not receiving class instruction in nutrition showed such a striking contrast to the consistency and size of the gains in the classes which were being taught nutrition (with the exception of two schools which lacked instructional materials), that one can scarcely question his conclusion that definite instruction in nutrition is needed if high-school students are to improve their attitudes toward the importance of nutrition and increase their knowledge and ability to apply nutritional information. On the other hand, the reader will not be inclined to agree with Frost and Banks in their conclusions that skills, information, and attitudes "desirable for home and family life are developed through home economics instruction,

which are not gained as effectively through usual life experience and motivation," when he notes that in most cases the difference in mean scores for the groups with and without high-school instruction in home economics differed only a few points on both the information and the attitude tests. Most of these differences in mean scores on the various sections of the tests exceeded the 1 percent level of significance because of the large number of cases involved, but both investigators appeared to attach undue weight to the statistical significance and to disregard the administrative significance of their findings.

Methods of Instruction

Studies by teachers of educational problems faced in their own classrooms are to be commended, but to date few teachers seem to recognize the importance of objective evidence or understand research technics, so their conclusions too often represent merely wishful thinking. McAlister (31) compared the achievement on a grooming and clothing unit of twenty-two ninth-grade girls, half of whom were paired with the other half on age and IQ. In one class, the teacher alone decided what was to be studied and evaluated achievement, in the other, the students were led to decide upon their own goals, the experiences needed to learn to improve personal appearance and grooming and how to construct their garments, and worked with the teacher in planning how to evaluate their achievement. The cases were so few, the evaluation technics so crude and subjective, and evidence of *comparative* gains so lacking that one might question the conclusions that the class with maximum participation on the part of the students showed distinctly superior achievement, were it not for the fact that Hatcher (27) reached the same conclusions when she had large groups, controlled conditions carefully, and used valid, reliable, and objective evaluation devices.

Evaluation technics which emphasize the importance of personality and character development and the social utility of learning and which promote learning as well as measuring achievement are described by Pricur (34). A series of informal anecdotal records illustrated how senior high-school girls learned to analyze their own behavior, decided what changes needed to be made, and determined their progress toward the goals they set for themselves.

In view of the conflicting opinions regarding how to promote the carry-over of class instruction into home living, an experiment by Akin (1) has particular significance. When home projects were placed upon a voluntary basis instead of a specified number and type being required of each student, it was found that teachers made more home contacts, that slightly more projects were completed and that they were less likely to be limited to foods and clothing, and that mothers reacted more favorably to the home project program.

Hatcher's doctoral dissertation (27) probably represents the most significant study to date dealing with methods of instruction in home economics at the secondary level because of the scope, the painstaking control of the experimental situation, and the variety of evaluation technics employed. She studied the relative effectiveness of two methods of instruction at the senior high-school level in foods and consumer buying. The achievement of the experimental classes was consistently superior to that of the control classes when students were paired upon IQ pre-test scores and socio-economic level; the differences were statistically significant in every instance in which the data were objective enough to permit statistical analysis, and the same superiority was shown in the more subjective types of evidence such as written reports, diary records, and interviews with students and their parents.

In the control classes the teacher dominated the situation, deciding upon the objectives of the unit, the class activities, and the assignments, and assuming responsibility for evaluating the students' work. In the experimental classes the students shared with the teacher the responsibility for setting up objectives, planning activities, and evaluating progress; and they used certain self-teaching, self-evaluating devices. It is not known how much of the superiority of the experimental method resulted from student and teacher cooperation and how much from the use of the unique teaching and evaluating materials. Hatcher's study made certain significant contributions. She developed a method for recording foods eaten and for analyzing food intake by the use of checklists instead of mathematical calculations; she showed that these checklist ratings correlated closely with ratings made on identical diaries when analyzed in the usual manner; and she discovered that when the experimental method was used, students made definite improvement in dietary practices as well as gains in information and skill in food preparation, although earlier studies by Botto (11) and Segner (37) had tended to show that high-school foods instruction had little, if any, measurable effect upon dietary practices.

Community Programs

Experiments in community cooperation in improving home and family life are under way in many places. Some of them are purely local projects, such as that in Greenville, North Carolina (36), in which girls in third-year homemaking had opportunities to learn how to meet and solve problems of housing and home management. Although not a research project in the ordinary sense, the procedures employed were carefully explained, objective data were furnished, and evidence was cited regarding the outcomes of the project in terms of individual, family, and community improvement. Other projects are more comprehensive, such as those being carried on in Kansas, Ohio, Tennessee, and Utah under the sponsorship of the Office of Education and those under way in Kentucky and Florida, which are

being financed by the Sloan Foundation. The last mentioned projects have progressed far enough for tentative results to begin to appear in print.

In 1938 the U. S. Office of Education selected two urban and two rural communities as laboratory situations in which to study how to find ways to bring about "stronger, richer, more realistic programs of education for home and family living through concerted community effort" (5). The communities chosen were Wichita, Kansas, Toledo, Ohio, Obion County in Tennessee, and Box Elder County in Utah. The progress made in these communities during the ensuing two years was presented in a series of articles by a member of the Federal Home Economics Education Service (16, 17, 18, 19). The programs have been developed to meet local needs but each one has a coordinator and an advisory committee on which are representatives of the cooperating educational and other community agencies. Accomplishments to date are manifold and may be classified as those relating to improving living conditions through cooperative endeavor to promote better health and more adequate housing; community recreation, adult education through expanded library facilities; the publicizing of lectures and classes dealing with home and family living problems; and the modification of school programs at all grade levels.

The purpose of the Sloan Foundation studies (21) was to discover the effect of school instruction upon community life. So far, investigations have been limited to nutrition and housing, but other aspects of family life are to be investigated later. Diets studied in several rural communities in Kentucky by means of surveys of food consumed at home and in school were found to be seriously deficient in protein, minerals, and vitamins, and children given physical examinations showed clear evidence of malnutrition and such diseases as goiter and hookworm. Housing is being studied in six communities in Florida by means of a questionnaire survey made by trained interviewers and a photograph of each house surveyed. A comprehensive program of achievement tests is being used to determine the relative achievement of pupils in the fundamental subjects in the control schools, operating with the traditional program, and in the experimental schools which provide vital instructional material relating to nutrition and housing problems. Statistical evidence is not yet available and subjective evidence indicates that it is possible to incorporate nutrition and housing into the ordinary class work from the first grade on, and for schools to help low-income families improve their living standards without an increase in cash expenditure.

Need for Guidance in Occupational Adjustment

The occupational adjustment of girls who graduated during 1921-1937 from high schools in Williamsport, Pennsylvania, and two nearby villages is described in a bulletin of the American Vocational Association (4). More than half of the graduates were married, a fourth of them within

three years after leaving school; about half had taken further training (chiefly for nursing, business, or rural school teaching); more than a third of those gainfully employed were working in factories or household service, but neither type of work was regarded favorably by the majority of the graduates. Whether single or married, most of them were living on low incomes and three-fourths of the rural graduates had migrated, usually to a larger community. It is evident that homemaking instruction for such groups should emphasize household management on a very limited income and that there is need for an occupational adjustment service for those seeking employment and for studies to show how home economics training can help place domestic service on a more acceptable level. The tragic implications of the desire for white-collar jobs which do not exist and the failure to recognize job possibilities in other types of work are shown in a study of the work experiences and future plans of about 9,000 girls in Grades VII-XII in St. Paul, Minnesota (14).

The need for effective guidance at the secondary level is shown in recent studies of mortality among college home economics students (28, 41). The high mortality among freshman women indicated that high-school students who aspire to go to college need to understand the types of instruction offered under the label of home economics and the intellectual demands of the various curriculums, as well as the approximate cost of financing a college education and the probable opportunities for earning.

Summary

The importance of home and family life education is widely recognized today and it is regarded as desirable for both sexes and at all educational levels. Although significant investigations in this field are still not numerous, certain trends are evident. Concern for the development and adjustment of the total individual in his present-day environment is growing; problems of merely theoretical interest are being replaced by those which come to grips with reality; and certain comprehensive, long-time studies which are subsidized from federal and private funds and which deal with the living problems of entire communities and attempt to discover the role of the school in family life and community improvement are getting under way. There is a definite need for more carefully controlled studies, for the development of more valid and effective measuring instruments, and for the utilization of appropriate statistical technics in analyzing the data collected so that the true meaning and the implications of the findings may be comprehended.

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CHAPTER IV

Industrial Education¹

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INDUSTRIAL EDUCATION includes both industrial arts and trade education. While these two branches of education have their similarities, they also have marked differences (30). In the schools the former is offered for its general educational values and the latter is offered for specific vocational preparation for employment upon graduation or for those now at work who wish to supplement their knowledge or increase their skill.

National Defense

In the program of training workers for national defense (87), neither of the branches of industrial education is assumed to be concerned for a long period of time with any individual inasmuch as training for national defense involves preparation for service in small areas of occupations or highly repetitive work in specialized production. Teachers of industrial arts usually are not qualified by practical experience to teach defense training. However, the equipments of both areas are used to their fullest, day and night. Moreover, after the emergency, trainees should not hold high hopes for permanent employability in trades because of defense training. Defense training is likely to be limited to temporary employment (2). Tarbell (88) has analyzed the national defense training program in detail in relation to: (a) the personnel to be trained, (b) types of courses, and (c) faculty qualifications. The need of industrial arts shops and services in producing small tools for training, and of deviating from the more general aims to specific vocational aims during the emergency, was reported by Finsterbach (26). Industry's analysis of the need for redefined objectives for industrial arts in national defense was reported by Bowler (9) as follows: aims in defense education must move from the realm of theory to the specific, immediately attainable goals, and the teachers must be trade qualified.

The most useful curriculum research technic in industrial education is trade and job analysis. Through this technic, curriculum content is obtainable from the place that it functions in the community. The problem of training for production, especially in an emergency, cannot await solution by the long and sometimes tardy process of theorizing and development of text materials by way of the schoolroom. Industrial education has long utilized the analysis technic; it makes its area of activity worldlike in value, and school and industry are closely cooperating with full understanding of purposes and content. In the present emergency, the practical content was made available on short notice by means of the analysis technic.

¹ Bibliography for this chapter begins on page 404

Having used this technic, Detroit (18) launched its defense training, a few days after authorization, with available course materials secured from industry. Dunwoody Institute (20) analyzed a series of occupations for widespread use in the emergency training program. These reports have not only current value but they offer curriculum materials of value for years to come. Outstanding among other investigations for determining curriculum content is the Texas report (89) covering the machinist trade and its related mathematics.

The most impressive achievements in course making by means of preliminary trade analyses are reported by the University of the State of New York in its Vocational Education Program for National Defense Industries (91), and by Detroit (19), and in their regular programs in Flint (41), Dearborn (28), Lincoln Park (14), and Grand Haven (49). Curriculum revision data were secured by Barich (5) from superintendents and foremen for twenty-seven occupations in a plant engaged in the manufacture of spark plugs, air cleaners, and small instruments. Defense training programs have been in effect about one year, covering one-third of the period of this report. The next two years should be a period of much development of valuable instructional material drawn from the community.

Growing Need for Industrial Training

Despite the need of training for national defense, there still remain two problems: (a) the need for secondary vocational preparation, and (b) the need of instruction in the skilled trades. Moehlman (67) reported that up to 1938 not more than 15 percent of necessary vocational training was provided by the schools. Woal (95) reported findings of a follow-up of the Koepke study (51) of 1934 on training, changing technology, and shift of workers to semiskilled classifications. The trend toward training needs is not clear inasmuch as apprenticeship is reported on the increase in all areas of industry; specifically, highly skilled tool and die makers and set-up men are in demand. Otherwise the training needs are theoretically reported to be lessening. It is difficult to compare the outcomes of these two studies inasmuch as the latter was made under depression conditions. Fryklund (31) reported that 44 percent of the workers in modern industry require extensive training. This does not include the great army of skilled mechanics in small shop and service occupations who will always require training. Kersey (48) refuted any seemingly convincing discussions on lessening industrial training needs in California by revealing facts regarding training, placements, and wages in Los Angeles. Gleason (33) presented evidence indicating public-school responsibility for training in semiskilled work. Those who doubt the growing need for industrial training are hard pressed for evidence supporting their beliefs in the face of recent events. The growth of trade education from 1918 to 1939 has been steady if one state can be considered adequate as a

sample for study. Hamilton (37) in a survey of placements found that 71 percent of the trade-school graduates were working with their first employers and 73 percent were working in the trades for which they were trained.

The desires of youth in relation to education were reported by Bell (7) in his study of conditions and attitudes of youth in Maryland. A real demand is evident for training in trades and crafts. Eckert and Marshall (21), although limiting their questioning technic, reported findings a great deal like those of Bell. Anderwald (3) gathered evidence of need for increased technical training in New York for automotive service organizations. His report covered both day and evening schools. Norton (71) surveyed the secondary-school programs and vocational adjustment of youth in New York and made recommendations for a statewide program characterized by breadth and flexibility. This study was made by a worker chosen from the general area of education in order presumably to prevent bias, but it actually resulted in many interpretations characteristic of a writer who is unfamiliar with the field. In contrast is the Essex County Vocational Survey, presenting a pattern that others could well follow in making similar studies. Campion (12) covered every phase of vocational education in relation to the schools, community, and industry. A comparison of these surveys gives evidence that studies of specialized areas should be made by persons who are familiar with the work of the area under consideration. Mathis (49) reported the Greensboro community survey of industrial firms for the training and employment possibilities of young people from eighteen to twenty-five years of age.

The growth of the numbers of shops was revealed by Claude (15) through data garnered from a publisher's list. A period of fourteen years was covered. This is the only comprehensive study that covers the numerical distribution of shops by states and the development of shop subjects on all levels of instruction, including colleges.

The effect of trade education on the lives of graduates of three trade-training institutions for Negroes in Virginia was studied by Hill (39). Supply and demand had not been balanced, and consequently 85 percent of the graduates of one school were not working at the trades for which they were trained. His recommendations included: (a) development of part-time cooperative education permitting specialization in many occupations; (b) employment of coordinators to reconcile the training efforts of industry and the schools; and (c) local occupational surveys in order better to determine needs. Smith (82) made a similar survey for North Carolina. Mills (66) and Stark (83) surveyed industrial arts training opportunities in rural, village, and county schools of Ohio. Stark found that 69 percent of the total enrolments of boys and 8 percent of the total enrolments of girls are in industrial arts classes. Edwards (22) used the survey technic to gather evidence in support of training needs for persons over sixteen years of age in the Lower Rio Grande Valley. Stroud (85) established the need for pre-engineering and technical curriculums by studying

the needs of three hundred boys. Wylie and Skinner (96) obtained from nine hundred boys and their fathers, suggestions for improvement of a technical curriculum. Rossow (78) found changing responsibilities of part-time schools for providing extension education for modern apprentices. Edwards (23) revealed that industrial arts teachers were not taking advantage of the many opportunities for including consumer education in industrial courses.

Broadening the Scope of Industrial Arts

A continuing long-time state industrial arts survey was reported for the Wisconsin schools (60). There is much valuable curriculum information for all persons concerned with modern education and modern social problems. Pennsylvania's committee of leaders in industrial arts (74) established policies for curriculum development including philosophy, content and method, supervision, floor plans, and equipment. Meyer (64) found that one hundred and ninety-five teacher graduates rated their college studies in terms of value as follows: technical, 74 percent; professional, 20 percent; scientific, 4 percent; and cultural, 1 percent.

There is increasing need for broadening the scope of technical content for training in the metal trades. Pancost (72) determined from the industries the amount of instruction needed during the first three years of earning in metal industries. Van Horn (90) and Jeppsen (42), by a canvass of teachers, workers, students, and executives, established a base for technical experiences in the occupational areas of publishing and printing. Martin (61) gathered suggestions through conferences and group meetings of specialists for improving instructional methods in printing.

Graphing—Cleveland (16) canvassed the need for study of the non-vocational making of charts, diagrams, maps, and sketches in the community. Heilig (38) and his committee cataloged all available types of graphs for curriculum use.

Safety—Studies to promote safe work practices in the shops are increasing. Many states and institutions are active in such studies, and new shop books are stressing safe construction procedures through integration. Smith (81) covered all aspects of shop safety. Estabrooke (25) surveyed practices among shop teachers in Pennsylvania. Schaudé (80) studied 766 accidents in three hundred cities and found accidents resulting from the use of hand tools most common, with the chisel being charged with the greatest number of accident frequencies.

Influence of Teacher Education

There is a strongly growing recognition of the influences on all public-school curriculums of the teacher-education institutions. Trends of philosophy and practices in the colleges are reflected in the public schools.

The American Association of Industrial Teacher Trainers sponsored a survey by Fryklund (29) that covered ninety institutions and their faculties, aims, offerings, directed teaching, projected changes, and points of general interest. Directed teaching seems to deserve continued study according to the listing of twenty recommended researches. Already several studies relating to directed teaching are under way. Landis (52) reported comprehensively on teacher education in industrial education in Illinois by investigation of the teachers in the secondary schools. Stoner's study (84) of eleven teacher-education institutions in Ohio resulted in the adoption of a set of guiding principles for evaluating and accrediting industrial arts teacher education in Ohio. Belanger (6) studied the immediate, day-to-day problems and difficulties of selected industrial arts teachers of Minnesota and compared the findings with their teacher training and experience patterns. Difficulties were in selection and organization of subjectmatter, teaching technics, course of study preparation, and lesson planning. The personal library of industrial arts teachers is usually inadequate according to Kerr (47).

Budgetary Relations, Equipment, and Service

Equipment and financial problems are associated with curriculum functions. Parkes (73) studied the costs of vocational industrial education in second-class school districts in Pennsylvania and found that the average per pupil operating cost in eleven cities was \$94.36. Britton (10) reported on the costs of instruction in nine vocational schools in Wisconsin. Buechner (11), in cooperation with seventy-five instructors, prepared a code of principles for industrial arts finance. A score card for evaluating, improving, and constructing industrial arts programs was developed by Weber (92).

Rose and Van Duzee (77), Pitsinger (75), Yaekle (97), Ghramm (32), and Meairs (63) contributed leading reports on equipment selection. An objective tool-index method of determining equipment lists was reported by Klehm (50). When his procedure is applied there would seem little reason for overequipping, underequipping, or for poor distribution of tools. Sources of materials which are free for the asking were cataloged by Groneman (34). Karnes (46) reported a new industrial arts experimental shop for try out of instructional materials.

There is a rapid trend toward the general shop in Grades VII to XII if a sampling of two hundred schools in Michigan is an indication. Chamberlain (13) reported that in these schools class size is sixteen to twenty pupils and the subjects taught in order are woodworking, metalworking, mechanical drawing, electrical working, and concrete working. Home workshops also are growing in number.

Interest in shop work for girls is increasing. Leming (54), Luse (56), McCauley (57), McFarland (58), and Werner (93) have reports relating to the selection and organization of materials suitable for girls. McHenry

(59) reported on student elimination in relation to school records. He found that school records meant little to teachers and administrators in secondary schools but if properly used were of vital aid in holding secondary-school pupils.

Methods of Teaching and Testing

Mechanical drawing—Birkeland (8) evaluated the oral method and the textbook method of instruction in drafting by means of experimental classes. The differences in gains by the oral method were not significant. Mechanical drawing offers objective situations that enable experimentation more readily than does shopwork. Jossierand (44) found that teaching drafting by models and sketching was more effective than teaching with the usual equipment. Morgan (68) studied the relative value of models and textbook, and the textbook alone, in teaching mechanical drawing. Nicholas (70) substantiated the beliefs of most mechanical drawing instructors that blueprint reading should precede the study of drafting.

Pupils—Fleming (27) studied three thousand students who were enrolled for more than one semester in a vocational high school to determine the relation between previous school records and vocational school success. Low correlations are to be expected if the theory of unique traits is valid. Hafer (36) evaluated personality and intellectual traits of pupils who elected and those who did not elect industrial arts courses.

Tests—Student machinists and patternmakers were used in validating one thousand facts of chemistry by Ardussi (4). Zinn (98) validated comprehensive trade tests for technical information in printing. Reed (76) reported a midget wiggly block test validated on high-school boys—better for machine shop than for general shop selection.

Teaching to think—What do industrial arts teachers do to train pupils in *how* to think, as well as what to think? Howard (40) canvassed 110 instructors in the Middlewest and found wide use of pupil planning and pupil evaluating technics for projects made in the shops. These technics are worthy of examination by persons interested in developing the problem-solving technic of teaching shop work. The promotion of thinking habits in the power laboratory was studied by Wittick (94). Hackworth (35) compared results in self-motivated and traditional shop classes.

Reading—Jeske (43) determined the incidence of reading interests of one thousand industrial arts boys ranging in age from twelve to seventeen years. The way books are written has a decided bearing on the number of readers. There must be organization and design, accuracy, clear writing, and much illustrative material. Ludwig (55), confronted with reading difficulties of machine shop pupils, studied their vocabularies in relation to the texts used. Micheels (64) discarded the traditional class period to join with arts and home economics in establishing a unified arts program.

Objectives—Struck (86) released the most useful report of this period, dealing with creative teaching. It is helpful to prospective teachers and to

teachers in service, whether in industrial arts, trade education, home economics, agricultural education, municipal training, or commercial education. Lee (53) revised the symposium report on objectives and problems of vocational education.

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CHAPTER V

Music¹

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RESEARCH IN MUSIC HAS, in the past, shown evidence of influence from the disciplines of educational testing and physics. Perhaps a disproportionate part of the literature has dealt with achievement and so-called talent tests. Much work has also been reported on the statistical refinements of these same tests

In both of these areas (talent and achievement), the search has been for isolated, predictable, manageable elements that could conveniently be measured with numerical indexes. The "talent" tests have sought for those elements *in the listener's organic make-up* dependable traits that would characterize the individual's musical potentiality. The achievement tests have sought for those elements *in the listener's information about music*, dependable indexes that would accurately classify the individual in terms of musical accomplishment. But there has been a dangerous tendency to become absorbed in the quest for basic units and indexes, and intercorrelations between them, with the result that the prime relationships between these units and the main job to be done by educators becomes all but obliterated. The brief and significant question, "So what?" might aptly be asked regarding much research in music education. But the field of music education has exhibited a tendency to proceed either in terms of trial and error plus individual ingenuity or in terms of the laboratory disciplines of physics and statistics. The great range for crucial and practical research which lies between these two extremes has had little attention from those reporting studies in the field of music education.

In general, the common objective of music educators, perhaps more easily stated than implemented, is to place music more vitally in the service of society. Such a purpose as this one constitutes a challenge to music education. Such basic questions as the following await the diligent application of research disciplines: (a) In what operational ways are the stated objectives of music education being accomplished? (b) To what extent do the achievements of music education match the needs of students in contemporary society? (c) What are the unique capabilities and limitations characteristic of students at various stages of physical and psychological growth? (d) To what extent are the objectives of music education stated in cognizance of these capabilities and limitations? (e) To what extent does music education now function in out-of-school life?

It is heartening to observe a trend toward studies which can aid in making the day-to-day teaching of music more skilful, more rational, and

¹ Bibliography for this chapter begins on page 413

² The author is indebted to Richard Cannon and Daniel D. Day for assistance in preparing this article

more effective. Many of the studies cited in the following pages confirm this trend.

Music and Correlated Factors

Background and musicality—Seashore (50) found the excellence of composers to be more highly correlated with good work habits and previous informal musical opportunities than with formal training and inspiration. In a study of superior Negro children Beckham (5) reported home background and interest to be more important than intelligence in predicting high music aptitude scores. But Friend (22) reported the home environment of forty-two children to be negatively correlated with the children's scores on Seashore tests. Van Alstyne and Osborne (54) found five-year-old Negro children superior to white children in rhythmic tests, but credited the difference to early home background since differences tend to level out in early years of schooling. Dykema (15) reported comparisons of scores on Kwalwasser-Dykema tests taken by over 5,000 students in European countries.

Sex—Gilbert (23) found the superiority of women's Kwalwasser-Dykema test scores to be attributable to more musical training. He found no evidence of native superiority in either sex.

Art—In a study of intercorrelations among tests of musical, artistic, and mechanical abilities, Morrow (34) found mechanical and artistic abilities to be more highly correlated than either musical and artistic or musical and mechanical abilities among male college students. Farnsworth (20) reported a positive association between music and art ability and personality adjustment among elementary-school children.

Intelligence—Kwalwasser (31) reported "the tendency toward mediocrity" in his study of the correlation ($r = .34$) between musicality and intelligence. Groups selected for high and low musicality show a strong trend toward mean intelligence scores. Groups selected for high and low intelligence show a similar tendency toward mean scores in musicality. Ross (46) reported very low positive correlations between Seashore test scores and intelligence. He found that students with superior Seashore scores, however, equalled or exceeded 80 percent of the population in composite scholastic standing. Dean (13) reported intelligence and prior musical training to be of little value in predicting success in sight reading. Karlin (30) analyzed two batteries of tests in an attempt to isolate primary music abilities. He found negligible correlations between scores on music tests and intelligence tests. His findings suggested three primary factors of music ability: tonal sensitivity, memory for elements, and memory for form. Mursell (35) wrote a critical summary of ten publications on correlation between musicality and intelligence. Correlations found in European studies were high as compared with those found in American studies. Mursell suggests that this difference may be attributed to an unfortunate

tendency toward using atomistic indexes as measures of musicality in many American studies.

Physiological characteristics—Farnsworth (18) found a tendency toward inverse correlation between auditory acuity and musical ability. The differences were not, in general, statistically significant, but the findings are in the direction indicated by the Adlerian theory of overcompensation for organic inferiority Wecker (55) reported a study in which totally deaf children were taught to recognize and reproduce rhythms and a few pitches played by concealed orchestral instruments. Jerome (28) reported change of voice in males to be more highly correlated with skeletal age (epiphyses of knee, wrist, and hand) than with either mental or chronological age. Christianson (10) found that rhythmic responses among pre-school children correlate with physiological development in motor coordination but that social inhibitions increase with age and result in decreased overt social-emotional responses

Methodology

Learning to sing—Drexler (14) found among school children a high correlation of ability to carry a tune with chronological age. But Jersild (29) and Updegraff (53) reported marked improvement of experimental over control groups of pre-school children in response to training in singing. Blind (7) concluded from a study of nineteen monotonies that all monotonies can be taught to sing unless they are physically handicapped. The method used was a gradual enlargement of the pitch range, beginning with the pitch of the students' habitual speech Jersild (29) reported a study by Sherman of keys in which 5,000 children preferred to sing Medium keys were preferred; low keys were next; high keys were least liked High keys became progressively less liked with increasing age

Learning to read music—Bean (4) used a tachistoscopic device for improving the reading of adults and students. He reported, among other findings, the necessity of grasping patterns of notes in cultivating rapid and accurate reading Wheelwright (57) concluded that notation could be made easier to read by making certain alterations in the shape and the grouping of notes. Ortmann (37) reported findings on the span of vision in note reading. He found that certain arrangements of notes influence the ease of reading them. Silvey (51) conducted a study of the usefulness of the sol-fa syllables in reading music From an analysis of nearly 2,000 subjects, he reported serious weaknesses in the sol-fa system. Stelzer (52) constructed a sight-reading scale for organ music. Reliabilities were high. The test items were synthesized from a pre-analysis of 309 organ selections which were well liked by college students.

Memorizing music—From a study conducted with experienced piano students, Rubin-Rabson (47) found methods involving pre-study of the score superior to methods involving no pre-keyboard study.

Tastes and discrimination—Aizawa (1) studied the lyrics and tunes of songs liked and disliked by eight hundred Japanese school children. Agreement of preferences increased as the school year passed. Structural characteristics liked and disliked were reported. Farnsworth (19) found that tolerance for unusual harmonic combinations increased with increasing age and familiarity with those combinations. The study involved fifth- and eighth-grade and college students. Wray (60) reported studies by Camerea and Eberle which showed that technical analysis is an aid in teaching students to prefer "good" music. Eagleson and Taylor (16) studied the preferences of 75 Negro women for various chords. The paired comparisons technic was used. The triad was best liked; minor thirds and sixths came next; major sevenths and minor seconds were least liked.

Musical Meanings

In an experiment with 450 college students, Hevner (26) used a unique method for determining the relative effectiveness (meaningfulness) of various elements in musical composition. In order of importance, the three elements which most significantly determine musical meanings were reported as (a) tempo, (b) modality, and (c) pitch. In a second study, Hevner (25) found that slow tempos were characterized as calm, serene, tender, and sad, fast tempos as happy, exciting, graceful, and vigorous; high-pitched music as sprightly and humorous, low-pitched music as sad, majestic, dignified, and serious. Rigg (45) reported an experiment which seemed to substantiate Sarantin's theory which holds that musical meanings may be accurately predicted by specifying the tempo, predominant intervals, mode, harmony, dynamics, rhythm, and staccato or legato to be used in a composition. But Rigg (44) reported that although college students can discriminate between sad and joyful music they show decreasing success as finer discriminations are attempted. In a third study, Rigg (43) found that transpositions of a fifth or an octave up made music sound happier whereas similar transpositions down made music less happy. Smaller transpositions had little effect.

Music and Emotional Reactions

Capurso (9) had ninety-five grade-school children in the elementary school write one-word descriptions of musical selections. The emotionally unstable differed from the stable students principally in that the former gave more unique words and tended to repeat the same words. Jacobsen (27), using a galvanometric device, found that mental states are affected by music. He recommended a program of mental hygiene through conditioning students to react in specified, desirable fashions to certain music. Loar (32) studied the emotional responses of one subject to the music of Schumann. He reported responses to music to be significantly linked with the subconscious. Moreno (33) treated a professional musician for severe

stage fright by training him to feel creatively and spontaneously during the performance of memorized music Altshuler (2) reported successful use of music in treatment of groups of mental patients

Radio

Wiebe (59) discussed findings from three surveys of students' radio program preferences He reported a tendency toward increased preoccupation with jazz with increasing age. Erdelyi (17) concluded that the effect of radio upon the sale of popular sheet music is a phenomenon of social pressure rather than a discriminating judgment of the buying public. Fox (21) studied children's preferences for various types of radio programs. The student sample was from twenty-five states. She reported the band to be the favorite type of music. Peter (39) reported a study of radio ownership, listening habits, and program preferences During a sample week in 1938, 52.5 percent of the total program time was devoted to music. Potter (40) made a survey in California to ascertain the amount and nature and the educational outcomes of radio listening in the schools of that state The Radio Research Committee of the University of Wisconsin (49) reported substantial success in teaching music information by means of radio programs. The Gildersleeve-Harrison Music Information Tests were used as criteria Wiebe (58) studied the effect of the "plugging" (frequent performances) of popular songs on students' opinions of these songs

General and Administrative

A survey (3) of current practice in granting college entrance credit for music was reported. Welch (56) reviewed the problem of college entrance credits in music and made recommendations. Riemenschneider (42) reported on a questionnaire sent to members of the North Central Association. The most frequent objective stated was "to create love for and interest in music throughout the entire student body" According to his report, buildings, equipment, and libraries were generally less than adequate. Faculty qualifications were "par" and community services were outstanding Clark (11) concluded from a study of music in Negro schools that music, in general, has been relegated to an unimportant status Connette (12), from a survey of opinion from in-service teachers, ranked supervisory procedures in the following order of desirability (a) visitation, conference, and criticism, (b) teachers' meetings, (c) demonstration teaching, (d) group and individual research, (e) directing professional reading, (f) administrative provisions, (g) directing the work of teachers, (h) out-of-town agencies, and (i) letters and bulletins.

Peckstein and Monk (38) studied the musical activities of the 57 percent of students in an urban high school who earned high scores on the Kwalwasser-Dykema tests They reported no participation in musical activity other than required classes for 47 percent of these students. Other findings

and recommendations were reported. From questionnaires filled out in 291 college examination centers, Beggs and Brigham (6) concluded that only half of those centers had phonographs which would rate C+ or above on a scale of quality ranging from A+ down to D—.

Reviews and Bibliographies

Borchers (8) reviewed and commented on eighteen researches in music. He dealt with studies in talent testing, violin and vocal vibrato, tone quality of piano and voice, the whole and part method of learning music, and the teaching of rhythm. Haydon (24) summarized new and interesting practices reported from forty departments of music (college level). Quarles (41) prepared a bibliography of one hundred books considered important in the field of music education. Schoen (48) reported an extensive bibliography of the periodical literature in the experimental psychology of music up to the year 1936. Mursell (36) reviewed sixty psychological researches in music education.

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CHAPTER I

The Nature and Function of Social Studies in Education¹

JOHN A. HOCKETT

THE NATURE AND FUNCTION of social studies in education cannot be precisely determined by strictly research procedures. The nature and scope of the social studies and the purposes for which they are taught in the schools are matters of definition and of judgment reflecting adherence to a set of values and the existence of a philosophy of life and education. Many of the references cited in this chapter cannot be described as research studies but may justifiably be included as representing the best critical thinking of individuals and groups which in numerous cases has emerged from many years' devotion to research and scientific analysis. Discussing the development of research in social studies, Wesley pointed out in the *Encyclopedia of Educational Research* (24) that the period from 1890 to 1916 was characterized by statements of general and somewhat unrealistic objectives, while from about 1916 to 1933 Herculean efforts were made to achieve objectivity. Since 1933 he found less emphasis on statistical studies and more reliance placed upon judgments of values.

Analyses of General Social Conditions

Analysis of social conditions, trends, and needs furnishes indispensable data for determining the place and purposes of social studies instruction. The Educational Policies Commission has attempted such an analysis in its *Unique Function of Education in American Democracy* (30). It listed among others factors such as multiplication of the functions of government, necessity of conservation, disintegration of family economy, changed foreign relations, and corporate ownership of wealth. It pointed out that education fosters the social virtues by example, that it is committed to the maintenance and improvement of American society, and that it must prepare young people for associational life and activities. A scholarly analysis of basic forces, trends, and tensions in American culture was presented by Counts (14). As basic forces he included democratic tradition, natural endowment, and technology. Past and present trends and tensions were traced in the areas of family, economy, communication, health, education, recreation, science, art, justice, government, and world relations. With these analyses as a background, he proposed a seven-point challenge to the program of social studies in the schools, indicating an emphasis quite different from that in the traditional school. In a significant report, the Commission on the Social Studies (1) sketched a frame of reference and

¹ Bibliography for this chapter begins on page 427

presented a statement of philosophy and purpose emphasizing the role of social studies instruction in a period of transition from an age of individualism to one of collectivism. It pointed out the important contribution of the social sciences to the formulation of an American educational philosophy, since this must emerge from a study of the elements, configurations, and trends of American culture.

Another committee, that on social-economic goals of America (25), presented an analysis of ten fundamental needs of all people and pointed out many implications for social studies as well as for the rest of the school program. The ten needs were listed as: (a) hereditary strength; (b) physical security, (c) participation in an evolving culture, including skills, techniques, and knowledges as well as values, standards, and outlooks, (d) an active, flexible personality; (e) suitable occupation; (f) economic security; (g) mental security; (h) equality of opportunity; (i) freedom; and (j) fair play. The Stanford Education Conference (36) presented analyses by authorities in several fields of aspects of American culture and of considerations basic to the formulation of a program of social education. These analyses included basic factors in democracy, control of social change, science and technics, use of natural resources, and welfare levels. As a basis for evaluating the content of courses in modern problems, Stokes (37) developed a list of recent social trends. A preliminary list of twenty-two trends secured from contemporary literature and reports was reduced to six on the basis of the judgments of thirty-nine "frontier thinkers." The following were selected as among the basic trends that should be considered in the problems courses: (a) an increasing population of older people; (b) the increasing unionization of workers; (c) the rise of governmental administrative boards, combining legislative, judicial, and administrative authority; (d) the development of social and health insurance; (e) the organization of cooperatives of various types; and (f) increasing leisure time for many people.

Analyses of Specific Social Factors

Several studies of restricted areas within the broad social scene have appeared recently. These supplement the more general analyses by revealing neglected or needed emphases in the educational program. Six factors which have promoted democracy in the United States were designated by Wesley (43) as follows: the American Revolution, the national debates of the 1830's and 1840's, the Civil War, the frontier, the rural character of America, and the worldwide faith in democracy. He listed as influences opposing democracy the process of urbanization, industrialization, and a growing intolerance. On the basis of this analysis he urged a revitalized civic education, with attention to democratic school administration, an improved curriculum, democratic methods of teaching, and a vital school life, combining intellectual analysis, emotional appeal, and training in skills. Bryson (6) analyzed the kind of character or citizenship essential

to democracy, emphasizing a mature individual, with a sense of freedom, a sense of responsibility and sportsmanship. Two reports from committees of the Progressive Education Association stressed the more immediate social experiences of young people. The Committee on the Function of Social Studies in General Education (33) analyzed the contemporary social setting and its implications for social studies instruction, devoting considerable attention to the needs and problems of the adolescent. Much basic material pertinent to the formulation of a social studies program in the secondary school was presented. Along the same line is the analysis of the needs of adolescents by Thayer, Zachry, and Kotinsky (38). They classified pupil needs into four areas: immediate social relationships, wider social relationships, economic relationships, and personal living. They criticized social studies courses for emphasizing social and economic factors without sufficient application to the immediate social relationships of the adolescent.

The issues and the literature of academic freedom in our times were reviewed by Hunt (21), who concluded that "college and university professors have very large, even if not complete, freedom to investigate, to publish, and to teach, and they have organizations concerned with preserving and extending that freedom. Teachers in the schools appear to have much less freedom. If they are to gain it, however, more than organization, tenure, and 'rights' are concerned. Teacher preparation and selection, teaching load and remuneration, the status of teachers and the attitude of the public towards the function of the public schools are all involved in any real solution." Goodhue and Wilson (17) set forth the results of an analysis of news items on the relations of the United States and the Far East during the period 1925 to 1935. They concluded that the bases of these relations are dominantly economic, and questioned whether current instruction leads pupils to understand the significant areas in our Oriental relations and whether it deals realistically with the important economic factors involved. As a preliminary step in his study of the civic information possessed by children, Burton (7) summarized several studies of problems and concepts considered important for the average citizen. He reported those listed by representative citizens and by frontier thinkers, those determined by analyses of newspapers, magazines, political platforms, and courses of study. Political, economic, and social problems and concepts were included. Brunner (5) analyzed two social trends, the declining birth-rate and the increase in technological efficiency, and indicated implications for instruction in social studies and other subject areas. Malan (22) analyzed the type of reading done by the American people in books, magazines, and newspapers, and urged that high schools make a persistent effort to train for intelligent reading of newspapers in order that a better informed citizenship may be produced. The problem of honesty was discussed by Omwake (31), and evidence on the relative honesty of junior-college freshmen was presented. Her data indicated that convenience and certain types of temptation break down resistance to dishonest con-

duct. Admission by four out of five students that they had cheated on examinations led her to question whether school practices encourage dishonesty. From an analysis of seventeen significant books and 130 issues of four selected periodicals, Church (10) developed a list of 135 problems and 123 trends considered important for an understanding of the Far East. A study of high-school courses and the knowledge possessed by high-school pupils convinced him that more attention should be given to the problems of the Orient.

The Nature and Objectives of Social Studies

Numerous individuals and groups have attempted to define the nature and scope of the social studies and to formulate the objectives of instruction in this area. The Educational Policies Commission (29) concluded that the democratic way of life is the inclusive purpose of American education and indicated four groups of objectives: those of self-realization, human relationship, economic efficiency, and civic responsibility. Wirth (47) presented digests of eleven research studies of objectives for the social studies, the majority of which were unpublished master's theses. Most of the studies involved collecting, classifying, and interpreting statements of objectives gathered from professional literature, courses of study, textbooks, nonprofessional articles, and questionnaires. The studies revealed a multiplicity and confusion of statements. One hopeful trend was indicated: a marked increase in emphasis on the functional aspects of civic education, more attention being given to the making of good citizens than merely to teaching the principles of good government. The fact that instruction in the social studies is conditioned by the spirit and letter of scholarship, by the realities and ideas of society, and by the requirements of the teaching and learning process was stressed by Beard (3). He also emphasized that in a changing world no fixed set of dogmas can be rigidly taught, but that the development of competent, rich, many-sided personalities must be the supreme objective. Later, he presented a more detailed analysis of the nature of the social sciences, collectively and individually (4). He stressed the fact that they are concerned with the social relations involved in all situations. He also emphasized that they are ethical sciences, concerned with the values inherent in situations and relationships.

Merriam (23) defined the scope and goals of civic education, stressing the need to face the realities of the present age and indicating the proper kind of civic education as the route to a much better world. Hughes and others (19) attempted to define the nature of social studies and their place in the school program. Hughes stated in his own frame of reference that the social studies should be the core of the curriculum, that this program should be closely interrelated and continuous from kindergarten through the secondary school for each pupil, and that its chief function is to give a knowledge of the contemporary world and the ability to adjust happily to it. He criticized adversely the attempt to organize the curriculum around

the major functions of social life. As a basis for discussing the social studies curriculum, the fourteenth yearbook (26) presented analyses of the nature of society, of the role of education, and of the nature of the social studies. The social studies were characterized as primarily concerned with human relations and as involving thought as well as knowledge. A critical appraisal of contemporary society and its problems was formulated by Rugg and others (35). Suggested curriculum changes, particularly in the areas included in the social sciences, were indicated as outcomes of the social analysis. It was recommended that curriculum design be based upon continuous planning, that it should provide a rounded day of living, a basic social program, and creative and recreational opportunities for work interests and for development of technics.

Weeks (42) analyzed the differing goals of civic education in a dictatorship and in a democracy, and pointed out some of the difficulties of achieving effective, realistic civic education. Greenan (18) stressed the importance of tolerance, free play of intelligence, scientific thinking, cooperation, and social sensitiveness as social studies objectives, and suggested ways of teaching such attitudes and ideals. The opinions and judgments of teachers with regard to objectives and content of the social studies were set forth in the research bulletin, *Improving Social Studies Instruction* (27). Elementary-school and junior and senior high-school teachers gave judgments on the relative importance of different objectives and on the degree of attainment of each. Similar judgments were expressed on the importance and on the adequacy of teaching in various areas within the field of social studies. In appraising the program of social studies in New York State, Wilson (45) formulated standards describing the nature and functions of an ideal program in this area. He recommended that each school in New York State assume responsibility for arranging its own curriculum; that the curriculum should deal more adequately with pupils' problems in human relations; that the curriculum be in process of continuous development; that each school develop its facilities for a social studies laboratory, and that teachers be adequately prepared for their work. Fields (16) stressed the importance of developing a consciousness of civic responsibilities and described the plan followed in one high school to achieve this aim. Caswell (9) analyzed certain social needs and the school curriculum, arriving at the conviction that fundamental curriculum changes are needed if the school is to meet its obligations in educating for social understanding and sensitivity and equipping its graduates to deal directly with significant contemporary problems. Ball (2) cited evidence that education for citizenship has largely failed to develop citizens who are willing to pay the price for a better world in which to live, and plead for a more widespread social conscience.

The nature and scope of social studies instruction as it might be if lay organizations were free to dominate the curriculum was revealed by Pierce (32) in a comprehensive analysis of the attempts of patriotic, military, peace, fraternal, religious, racial, youth, labor, business, and prohibition groups to influence the work of the schools. A historical account of the

nature and alleged functions and values of the social sciences in American schools during the past century or more was given by Tryon (40). He revealed the influence of national organizations of social scientists, educators, and others on objectives, curriculum, and methods in history, political science, economics, sociology, and social studies. Wilson (46) traced the movements and influences that have led to changed conceptions of the nature and function of social studies in the junior high school, with special reference to fusion courses. He reached the conclusions that these influences have modified both fusion and nonfusion courses, and that both types of courses may be made functional but that neither type is automatically functional. In its analysis of the relationship of education to economic well-being, the Educational Policies Commission (28) urged education for better understanding of industrial relations and of the significance of public expenditures, development of more cooperative attitudes, more adequate education of the consumer, and education for wiser saving. Clark (12) contrasted the economic information needed by the average citizen with that taught in schools, and urged that sweeping curriculum changes be made in order that our people be equipped to meet their personal and group economic problems more effectively.

Hunt, Thorndike, and Clark analyzed the problems involved in developing greater economic literacy and competence. Hunt (20) emphasized efforts made in schools in recent years to achieve this goal. Thorndike (39) emphasized the widespread illiteracy in this area, the need for definite, observable, and, where possible, measurable educational objectives, and suggested some types of learning that seem possible and desirable. Clark (11) indicated something of the scope of an educational program for economic literacy and some of the next steps in achieving it. Arguments were presented by Watts (41) to show that there is considerable agreement among reputable economists on many principles of economics, and that teachers should master and teach those principles. Coleman (13) analyzed some of the essential objectives of consumer education and the difficulties in making such education effective. He concluded that buying information alone is not enough, but that consumers must comprehend the forces in modern economic society antagonistic to their best interests and organize to protect themselves. Cassels (8) indicated factors leading to the rapidly growing field of consumer education and analyzed some of the needs and objectives for consumer education. Wilson (44) pointed out that consumer education involves the development of standards of values in pupils' minds, that it implies knowledge of the economic system as well as buying information, and that it represents not a narrow subject but a contribution to the developing personality of the student. Problems of propaganda and the obligations of the school in teaching its pupils to guard against propaganda were analyzed by a group of educators and social scientists (15). Quillen and Krug (34) reported the general plan of the Stanford Social Education Investigation, a five-year program designed to help teachers clarify their purposes and technics in the teaching of social studies.

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CHAPTER II

The Curriculum in the Social Studies¹

J. MURRAY LEE

A CLEAR PICTURE of the development of the social studies curriculum from 1937 through 1940 cannot be obtained by summarizing only the research that would meet the approval of a graduate committee. Numerous reports of successful practice are extremely significant even though they have not been carefully evaluated by objective measures. Materials summarized in this chapter are selected from three sources: (a) a few articles written from such a rich background of experience that their significance cannot be questioned, (b) a number of articles reporting successful practices, and (c) articles that are strictly research.

Previous Summaries and General Treatises

Previous reviews relating to the social studies curriculum include Hockett's (58) chapter in the *REVIEW OF EDUCATIONAL RESEARCH* dealing with the "Curriculum" and the chapters of Wilson (153) summarizing the research on the psychology of the social studies both on the elementary and secondary level. A valuable supplement which is useful in connection with this discussion is the February 1940 issue of the *REVIEW* covering the "Social Background of Education" (14). As part of the publications of the Commission on the Social Studies, Horn (61) provided a comprehensive summary and synthesis of research findings on problems fundamental to learning and teaching the social studies. The eighth yearbook of the National Council for the Social Studies (8) abstracted a number of research studies in the field of curriculum. Wilson and Murra (152) presented a condensed statement pointing out specific ways in which educational research on problems of teaching the social studies has affected practice "during the past generation."

The most comprehensive questionnaire study of the practices and opinions of 1,764 superior teachers of the social studies on both the elementary and secondary levels was reported in *Improving Social Studies Instruction* (102). It deals with objectives, curriculum content, methods, equipment, community study, teaching controversial topics, and testing. It includes lists of standard tests and textbooks most widely used.

There are a number of excellent articles of a general nature which have sufficient significance to mention. Ayer (5) made an excellent summary of the changing social studies program. Professional books by Bining and Bining (11), Johnson (65), Newlon (108), Schutte (133), Smith (137), and Wesley (150) are comprehensive treatments of the social studies pro-

¹ Bibliography for this chapter begins on page 440

gram Statements of developments in the thirty experimental schools have been prepared by McCutchen (84, 85). *Social Studies in General Education* (120) is the comprehensive statement of the philosophy directing the work of the thirty schools. It is valuable for the background which it develops Bagley (6) analyzed the training and selection of social studies teachers in the United States, and Thomas Alexander (6) provided a comprehensive treatment of the programs and education of teachers of social studies in Europe *Education and Economic Well-Being in American Democracy* (103) supplied a rich source for considering material in the economic field.

Status of the Social Studies

Objectives—A study (151) of the opinions of 3,327 teachers of the social studies in New York State as to what they felt were the objectives of the social studies yielded the following five as the principal ones: character and citizenship, individual responsibility and social cooperation, sensing trends, tolerance, and understanding present environment. Wirth (8: 21-43) summarized a number of previous studies of objectives. In general, he indicated that such studies as were included in his summary were really of little worth in providing guidance in the field of objectives. His evidence indicates that extreme verbalism has been rampant in developing statements of objectives.

Development—There have been several interesting analyses of the historical development of the social sciences. Roorbach (127) has carefully traced the development of the social studies before 1860. Lawson's study (76) showed the pattern of change which has taken place in the past hundred years in the social studies program in ten representative cities. King (70) traced the development of a course in world history. A most interesting study of the development of history in the schools of England was made by Shropshire (135).

Existing courses—There have been several delineations of social studies offerings in various states and on various levels. Kellough (66) analyzed offerings in Nebraska, Prentice (117) and Foscue (36) in Texas. Hall (49) surveyed the courses offered in twenty-five junior colleges in California and concluded that too much time is given to university preparatory work. Packard (111) summarized the objectives, content, and methods used in introductory courses in college. Hockett (59) found courses or units in Pacific relations fairly common in the Far West.

Student opinion—Several studies of student opinion give interesting leads in considering the curriculum. Mettling (92) questioned 360 high-school seniors. The sociology course was rated as first by 70 percent of the students who had had it, while modern and ancient history were rated as least important. A questionnaire prepared by Harper (54) given to 1,500 seventh- and eighth-graders in the Middlewest indicated that 72

percent of them disliked history. The majority of the reasons for their dislike were "too much memorization, lack of continuity in the material, dull and uninteresting subject matter." CCC men (57) criticized social studies from the standpoint of failure to furnish occupational information, failure to create a sound attitude toward their working world, and failure to arouse interest in current happenings.

Scope and Sequence

There have recently appeared many proposals for the scope and sequence of the social studies curriculum. A volume edited by Michener (94) contains many suggestions. A number of these have been based on various analyses of human activity. The scope and sequence suggested by the Mississippi program has been published in a number of references by Frederick and others (32, 38, 41, 97, 98). They have also suggested certain grade placement for the problems of life which they list under their areas of human activity (39, 40).

Many of the proposals for scope and sequence have appeared in curriculum bulletins. A few of these have been summarized by Lee and Lee (78). Harap (50) summarized the recommendations of 96 activity curriculums, 61 curriculums, and 19 sequence charts. An extremely helpful article to those who are experimenting with scope and sequence is one by Brown (13). Marshall (88) continues to stress the need of developing an understanding of the total social pattern. He feels that a pupil can be led very early to secure an awareness of the wholeness of social living and its essential processes. Welling (149) outlined a scope involving the social studies and the natural sciences. Sexson (134) presented a useful chart suggesting a pattern of growth that might prove to be a helpful guide in the social studies. Chapters by Brunner and Peters (14) in the issue of the REVIEW dealing with "Social Background of Education" summarized material on social forces and social values which is essential in developing a scope and sequence.

Combined Courses

Core courses—An excellent overview of problems involved in developing a core curriculum has been presented by Leonard (80). He stresses that one of the main difficulties of such work is the problem of teacher insecurity. When they move out of the regular subjectmatter field they feel insecure in dealing with the newer problems. Features of general education on the secondary level have been analyzed by Mackenzie (106). He discussed a number of proposals for the core curriculum. Biddick (10) summarized the important developments growing out of the curriculum program in the Denver secondary schools. Powers and others (106) supplied a detailed discussion of selection of curriculum for general educa-

tion and provided a list of situations and problems with which the individual must deal in the course of his living in a democratic society. They also listed traits and capacities needed by the individual if he is to deal adequately with such situations and problems. These are: (a) careful and critical thinking, (b) significant interests, (c) insights, (d) attitudes and appreciations, (e) values and standards, (f) creative activities, (g) emotional control, and (h) a philosophy of life. They suggested that materials can be organized either according to cultural periods or studies of contemporary knowledge and belief; they recommended a combination.

Featherstone (33) made many suggestions for the development of behaviors rather than the learning of subjectmatter, especially for the non-academic pupil. He says: "I should not begin with an assumption that the subjects must be combined or replanned on some other pattern. I should begin with the assumption that all teachers wish to work in the direction of identical social values. I should then try to help develop better activities within the framework of existing subjects."

Correlation—One way to make correlation between subjects more effective is to determine the aspects of one subject which contribute to another subject. Hellmich (55) analyzed junior high-school textbooks in the social studies to discover the mathematics involved. Leibson (79) analyzed biology to show how it can contribute to a study of modern problems. King (69) pointed out the topics common to commercial and social studies courses. Miller (96) showed types of literary materials having significance for social and economic problems. Michener (95) suggested ways of using music in the social studies. Barber (7) described the correlation of American literature and American history around periods. Maynard (89) showed how consumer material would fit into the curriculum. These studies are valuable in that they show phases of one subject which can aid in understanding the concepts of another. Where attempts are being made to correlate subjects, these courses should be carefully worked out on the basis of such studies.

Pond (115) studied the increase in the knowledge of vocational objectives of an experimental group in world history. In the experimental group these objectives were stressed to show how they contributed to social and vocational adjustment of man. Lackey (73) showed that there was little change in certain geographic background material as a result of having had a course in American history.

Modern Problems in the Curriculum

A major emphasis in this period has been on investigations in the field of modern problems. Wood (156) discussed the principles justifying the use of modern problems. Mary Harden (52), in her description of the development of concepts of safety of the class over several years, makes it very apparent that growth is most gradual in understanding the various phases of a problem.

Controversial issues—Evidence is accumulating to indicate that in most school situations it is possible to present controversial problems. In support of this position there is a description by Kickhafer (68) of the discussion of strikes and strike technics carried out in the Flint schools while strikes rocked that city. A study of 119 teachers in the Bay area of San Francisco by Turner (144) indicated that most of them felt free to deal with modern problems and that the reason they did not do so was due more to inertia than to community pressure.

Sources of problems—A number of studies proposed to select problems for study, utilizing a variety of technics. Oberholtzer (109) analyzed books and periodical literature for a list of problems and generalizations dealing with agriculture. This is helpful but by no means is to be recommended as a research technic which assures adequate coverage of the field. Problems may be omitted or be biased, and generalizations may be erroneous. Goodhue and Wilson (46) analyzed Sunday issues of the *New York Times* for four months of each year during the years from 1925 to 1935 to determine the problems of the Pacific area which are important. The difficulty of using current topics solely for study was clearly shown, for if we assumed that the basis for selecting countries for study was the amount of print devoted to them the Philippines would have been studied in '26, '27, '32-'36; Japan in '25, '29, '30, '32-'36; China in '25-'27, '28-'32; Hawaii in '32 and '35; Samoa in '26. Church (20) analyzed seventeen books and 130 issues of four magazines dealing with China and Japan. This study revealed 135 problems and 123 trends which he supplemented from his background of experience and training with five fields not sufficiently covered by the problems-trends analysis. Such a procedure is valuable in that analyses are not accepted as the final word. Hockett (59) showed how extensive were the courses dealing with the Pacific.

Another basis recommended for the selection of social problems is to determine phases of the social lag and to study them. Olsen (110) stated that this technic will help select the most important of the modern problems which need to be considered and avoid the difficulty of insignificance, of which many modern problem courses are accused. He presented his formula for determining social lag and showed in various areas the principal lags, which he then recommended as a basis for a program.

The Curriculum Society (91) requested suggestions for future issues of *Building America*. Out of 333 replies, the following topics were mentioned in over half of them: "Finding Your Job," "How Our Federal Government Serves Us," "The Farmer's Problem," "News," "War," "Seeing America," and "Applied Chemistry." Miller (96) submitted a list of problems to a group of competent people for judging and found that family relations, thrift, and peace were the most important of her seventeen problems, and that economic problems on the whole rank higher than social problems. A somewhat comparable study was made by Stokes (140, 141) who submitted 22 trends to 65 selected scholars and found that the follow-

ing six trends were most basic to a modern problems course in the opinion of the judges: increasing oldsters, increasing unionization, increasing governmental control, social and health insurance, cooperatives, and increasing leisure time. The questions of high-school seniors were classified by Cameron (17) into four areas: earning a living, handling income, living with others, and personal care.

Analysis of texts and courses—Gavian (43) analyzed 420 general and social studies courses for the first six grades. The analysis was to determine the topics about which learnings related to economic competence appear to cluster. She recommended that "consideration be given to the understandings necessary for achieving the democratic control of economic power and a wider distribution of the products of industry and agriculture." Are modern problems being taught through American history courses? An analysis of thirteen American history textbooks which was made by Levine (81, 82) showed that there is little tendency in such books to treat with importance problems in American life in the contemporary aspect. He analyzed these books for fifteen major problems confronting American citizens and found that there was little material on the problems included after 1929. A substantiating study of the slow change of texts was made by Stokes (140). In 1938 he studied the revisions of four texts treating modern problems which had been studied ten years previously by Floyd. He showed "that the emphasis and content of modern problems courses as revealed by textbooks has changed very slowly. Obviously then, a teacher cannot and should not depend solely on a textbook if he wants to keep the course abreast of current trends." Price (119) studied the use of periodicals in the classroom and found that out of 244 schools, 43 percent of the teachers were too busy covering informational requirements to allow time for periodicals.

Student preferences—Brooks (12) asked over 1,000 seniors and 1,200 high-school freshmen to indicate ten out of forty-eight problems in which they were most interested. In the first ten in both lists were education and crime, taxation, immigration, types of government, and the depression. Sociological problems obtain more votes from girls while economic and political problems interest the boys.

Teaching practices—Studies of teaching practice were made by Stokes (141), Davenport (25), and Kircher (67). These studies in general indicated a widespread use of some type of modern problems course.

Areas of problems—Four areas of modern problems seem to receive considerable attention. These are family living, consumer education, propaganda, and housing. Two comprehensive treatments of problems of family living appeared recently (1, 47). These provide basic treatments for curriculum planning in this area. Courses in consumer education have been analyzed by Rivett (125) and Harap (51). From both studies it is clear that such work is offered in a variety of courses such as sciences, social studies, commerce, and home economics. They show how necessary it is for

each school to analyze its own offerings in this area to prevent needless overlapping as well as omissions.

There has been considerable interest in propaganda, undoubtedly due to the publications of the Institute for Propaganda Analysis (62). Other than its publications, one of the most helpful treatments of the problem is the seventh yearbook of the National Council for the Social Studies (29), which acquaints teachers with the basic concepts in the field and supplies them with actual suggestions for teaching. Armstrong and Wood (4) describe a unit on analyzing propaganda in which a teacher of social studies and mathematics cooperated.

One of the main difficulties in the modern problems course is the lack of basic materials. An excellent example of the type that is needed has been supplied by Davies (26) in the field of housing. Clark (22) suggested material on housing to be studied on each grade level. This is illustrative of a development of a vertical strand of material to result in an increased understanding through the grades. The primary difficulty would be to combine several such strands into a social studies program for a given grade level. Troelstrup (143) presented an outline of material on housing. It is illustrative of the type of material against which accusations have been directed as being negative. Its emphasis is definitely on housing lacks. Another study on housing has been reported by Baumgartner (9). His outline is definitely superior to that of Throelstrup for it stresses the achievements in housing as well as the lacks. A survey of conservation education was made by Fogarty (35). He showed the widespread interest in conservation and the types of material supplied through state sources.

Interesting units—In the many descriptions of units of work, several stood out as unusual. A class at the University High School at Ohio State studied the question, "What contributes to the making of the modern mind?" Van Til (145) reported this unit in detail and suggested many learning activities carried out. It is an example of a type of social studies program for superior students. Stewart (139) described a period of work with fourteen-year-olds which illustrated how a teacher selected content from enriching and exploring the children's living. Units developed in a continuation school were outlined by Fox (37). They centered around subjects such as labor laws and unions, safeguarding the workers in factories, and workmen's compensation. This article should give social studies teachers a new perspective. It becomes clear that careful curriculum building requires people with a variety of background and experiences.

Students' knowledge—The sources of pupils' information on current affairs was shown by Lammers (74) to come first from the radio, second from the daily newspaper, and third from news weeklies. Burton (16) found that there was no marked change in civic information of students from 1924 to 1934, that the economic status of the home was most closely correlated with the amount of information, and that boys were better informed than girls. Tests to determine attitudes toward and understanding

of communism, fascism, and democracy were given to eighty-three seniors by Porter (116). The pupils revealed a rather appalling ignorance of the real meaning of the doctrines about which they "feel" so definitely.

Learning Experiences

A most comprehensive study of the reaction of students and teachers to learning activities in the social studies was made by Price (118). Most essential activities from the standpoint of the teacher are those which require gathering of information from numerous sources, and recitation and discussion of the facts thus collected. The activities rated as most popular by the students involved a greater element of direct experience and also a greater element of creative activities than those rated highest by the teachers. Teachers seem to place too much emphasis on the printed word and too little on other aids.

Democracy—The most helpful volume for providing actual suggestions for improvement is *Learning the Ways of Democracy* (104). Ninety high schools in twenty-seven states were visited to gather the data for the volume. It is rich in its many suggestions and descriptions of actual procedure and learning activities. It is highly significant in showing how much more effective the presentation of outstanding practices can be than merely a survey of average practices. Carrothers (18) reported the vital participation of an American problems class in an election to adopt the city manager plan of government. The students participated to a great extent in this campaign. Another class of seniors published a 200-page booklet history of their own community and sold 1,000 printed copies (131). The Norris School (60) runs its own cooperative. Twenty-five young people of New York spent a summer on a work farm (126). This undoubtedly has value, especially for certain types of overprivileged children. The junior high school at Ann Arbor developed its own camp (146). Two long trips by students were reported by Lucke (83) and Fitzgerald (34). The primary results seem to be the maturing of students through the impact of reality and the increased consciousness of social problems. Opportunities for children to work with others are a very definite need in the rural schools. Wofford (154) made a number of helpful suggestions.

An analysis of the types of learning activities included in forty-three work books was made by Mead (90). Forty-two percent involved collecting data, others such as remembering, expressing oneself, observing, organizing, and comparing ranged from 5 to 10 percent. There was a definite neglect of problem-solving activities.

Some activities are very real, growing out of pupil needs, and others seem most artificial in their emphasis. This latter seems particularly true of those which stress procedures according to the exact form followed in adult life. Two such studies of elections are typical (2, 87). They reported with great enthusiasm that students not only learned how to enter a voting booth but learned how to mark and fold their ballots. They did not seem

to question or worry about the fact that "there was a strong tendency to vote a straight rather than a mixed ticket" or that "appeals are made to the emotions rather than to the intelligence" It would seem that there should be much more concern about where to put the X on the ballot than how to put the X. Another artificial study was one where the class built a room in their classroom (77). The pupils did not like it because their new room was not attractive due to scarred walls and poor lighting The article described how they built a room inside the classroom, but evidently no attempt was made to improve the appearance of the classroom itself

Personal and social adjustment—One of the most interesting developments in the social studies is the twelfth-grade course to meet pupils' needs Stelter (138) summarized the development which has taken place in Los Angeles The units have developed in the areas of personal and social relationships, consumer problems, family relationships, community relationships including vocational, educational, and recreational opportunities, and review of English and arithmetic skills These units have grown out of the major concerns and interests of students at the twelfth-grade level A suggested program for problems involving personal and social adjustment has been suggested by Michener (93). There has been a great deal of discussion relating to the need for developing social consciousness Moore (99) analyzed the reasons 2,500 high-school students gave for having some form of social ambition to be helpful.

In the field of the elementary social studies, one of the most significant developments has been utilizing situations to help students improve their adjustment to personal problems rather than the entire emphasis being placed upon the development of broad, social understandings Suggestions of possibilities for such a program were discussed by Lee and Lee (78) Wasson (148), in a study of content of children's letters and conversations, listed a large number of social situations and relationships which concerned children His study provides further suggestions in the same field. Harless (53) described in detail the method of interpreting social behavior for individual students This is an account of what is being attempted in this field at the P K Yonge Laboratory School at the University of Florida The situation of handling money is studied by Gavian (42) with a small group of children She concluded that the training given them by their parents is totally inadequate.

Textbooks

Research on textbooks is primarily of three types: first, studies attempting to analyze reading difficulties, second, analysis of texts to determine treatments given to certain problems, and, third, the analysis of certain biases. Landsittel (75) reported a study to determine the effect of condensation on world histories While the technics could be criticized, it is clear that the "degree of condensation necessary to tell the history of the world in one volume is utterly fatal to real intelligibility to high school

youth." Hall (48) showed how the difficulty of a text could be measured by submitting passages to students. Wallace (147) showed that students' difficulties in reading geography textbooks were due to a lack of concrete experiences on the part of the pupils and to the fact that the textbook itself at times is not wholly intelligible. Rutter (124) showed that one difficulty is the fact that technical terms have few repetitions in geography texts. This places the responsibility on the teacher in helping students get acquainted with these technical terms. Burnham (15) demonstrated that there is an unnecessarily heavy load of technical terms in geography texts. The war content of early American history texts was analyzed by Cole (24). Only two of these made any attempt to depict the horrors of war. Perpiñan (113) summarized the investigations of textbooks made in various counties. Most of the studies he dealt with were made in the '20's and early '30's. The extremely nationalistic tone of the books has considerable significance today.

Another method of analysis is to determine the treatment given to a topic in a number of texts. An analysis (27) of the Haymarket affair in 1886 in various textbooks showed the emotional bias of the time in the earlier textbooks while the more recent textbooks give a more objective approach. However, the facts cited by many of them are as unreliable today as earlier, indicating a rather decided lack of scholarship. Gilpatrick (45) analyzed seven American history books for their geographical concepts. Three of them showed some real evidence of pointing out the relationship of geographical concepts to history.

Pugh (122) analyzed textbooks by taking passages from them to show bias. He pointed out that "no one has yet heard of the suppression of a civic textbook which presents the American society from the standpoint of the conservative capitalist." A most comprehensive attempt to analyze textbooks is the one carried out under the direction of the National Association of Manufacturers, in which Robley and his associates (105) analyzed a large number of social studies textbooks. This analysis resulted in considerable controversy (132). He concluded that there was not so much evidence of bias as poor scholarship in social science texts. The Rugg Series has been a storm center (101) for a number of years, and Rugg's rebuttal to the attacks appears in *That Men May Understand* (128).

Environment-Centered Curriculum

During this period there has been marked emphasis upon the community as a factor in building a social studies program. Many references have been adequately summarized by Cook (14: 14-22). A definite attempt will be made to avoid material cited by him. One of the Georgia Curriculum Bulletins (44) is an example of suggestions furnished to the teachers in utilizing the community as a basis for instruction. One fault with this, as with much of this material, is that it neglects to furnish actual data on state conditions.

The need of adapting a curriculum to the social situation and background has been stressed in many writings. Parker (112) has supplied the most vivid description of the social background of children coming from the slum areas in Cincinnati, Ohio. Another community surveyed was one in northern New York (129). Henderson (56) surveyed a small rural county in the south. Clapp (21) described two community school programs, one in a rural area and one in a community of homesteads. Jensen (63, 64) reported on the follow-up of Krey's regional program (72). In general, there was favorable reaction to the work. Her report is an indication that there is a need for more careful case studies of curriculum programs showing pitfalls and failures as well as successes. Both Wood (155) and Mackintosh (86) reported drawing up of a social studies program from community study of different types of communities. Petersen (114) developed a fourth-grade course which stressed the contributions of the nations represented in the local community.

The value of field trips to understand community patterns has been shown by Riggs (123), Scanlan and Weinberg (130), and Eisen (28). Surveys of various phases of the community have been reported. Sutherland (142) showed how children discover profitable and unusual people who can contribute to the school program. Sloan (136), by analyzing the background of college freshmen, showed how a study of their local community can increase their backgrounds. Koopman and Hatch (71) described how college freshmen can be used to make continuous nonoverlapping surveys of various phases of community life. A standard of living survey was reported by Ellis (30). Prosser (121) suggested a technic of surveying the attitudes of a community.

Understandings

There have been too few studies of the students' understandings of social concepts. This is a field in which a great deal of research could possibly be done. Eskridge (31) found that the following factors influenced growth in the understanding of geographic terms: amount and kind of experience, level of attainment in geography, mental age, and ways in which meanings of terms are verbalized. Chisholm (19) studied high-school students' understanding of tariffs and the Monroe Doctrine. There was a wide range of understanding of these concepts, and juniors and seniors have only a slightly better understanding than have freshmen.

The development of international understanding by means of the curriculum was the subject of a yearbook of the National Society for the Study of Education (107). Several chapters suggest ways in which the various social studies can contribute to international understanding. Anderson (3), in a test of attitudes and understandings toward certain campaign issues, shows clearly that pupils need discussion to clarify concepts. Wide reading in current publications is not sufficient.

Conclusions

Several needs are clear after summarizing the publications of the last three years. Careful study of student opinion should yield significant information and contribute to both the reorganization of the curriculum and teaching procedures. There were few basic studies made of how understandings, attitudes, and behaviors are developed. Careful planning of the curriculum is definitely needed. It is clear that the development of the individual comes gradually over a period of time. A concept cannot be immediately mastered or a behavior immediately fixed. Recurring opportunities for these learnings should not be left to mere chance. There is a vast amount of material available which is untouched in the usual social studies program. A careful selection of material should be made which will be basic to the understandings which are to be developed.

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CHAPTER III

Methods of Learning and Teaching¹

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Previous Reviews

HODGKINS (46) gave a summary description of all the new methods of teaching with their applications to the social studies, and concluded that the experimental studies in comparative teaching methods have been thus far rather indecisive. Hockett (45) annotated research studies in the field of social studies in the April 1937 number of the *REVIEW OF EDUCATIONAL RESEARCH*. In the February 1938 issue of the *REVIEW*, Wilson (113) did a similar survey of research in the social studies. In both of these summary statements, a special section of the chapter was devoted to methods. Horn (47), in his report in 1937 for the Commission on the Social Studies, attempted to canvass all the recent literature (up to 1937), including unpublished theses, on methods of teaching and learning in the social studies. Phillips (80), in a chapter in the 1937 yearbook of the National Council for the Social Studies, reviewed ten research studies on methods carried out from 1928 through 1935. He listed sixty-three additional studies dated from 1921 through 1935. In this same publication Davey and Hill (17) evaluated six studies, ranging from 1927 to 1931, on the effectiveness of the so-called Morrison unit-mastery plan as compared with other methods of instruction, and reached the conclusion that the superiority of any one method had not been established.

Studies of Method in General Education

Wilson and Murra (112) found that the achievements of research in psychology and in education as a whole have had a marked effect on the teaching of the social studies, but that the research accomplishments within the social studies themselves have not been so noteworthy or influential.

A bulletin of the Progressive Education Association (84) showed that the children in schools of newer educational practices made about equal progress in knowledge of conventional subjectmatter and better progress in other important areas of knowledge and in the matter of attitudes and behavior. The implications of research findings for teachers and administrators planning the individualization of instruction in the high school were presented by Briggs and others (8). In an account of one phase of the Cooperative Study of Secondary School Standards based upon replies from more than 17,000 pupils, Eells (23) concluded that a varied and

¹ Bibliography for this chapter begins on page 454

complete program of pupil activities is considered by the pupils an integral part of a modern, fully functioning secondary school.

Surveys of Practices in Social Studies

On the basis of a questionnaire survey of social studies instruction which secured returns from 1,764 classroom teachers out of 6,776 teachers listed by their 942 city superintendents as "of recognized ability who had been teaching at least two years in the school," the Research Division of the National Education Association (74) found the technic of instruction most generally reported in use to be the socialized recitation. Individual activities and textbook recitation were used the least. The preferred technic on all levels was that of group activities, and the least popular was textbook recitation. Newspapers and magazines were the two supplementary sources most used on all levels. The main reason for not making extensive use of community sources was the lack of time in the school schedule. The three greatest needs for the improvement of instruction (reported by nearly 60 percent) were more reference books, smaller classes, and auditory and visual aids. Price (83) ascertained, described, and analyzed the present practices of superior social studies teachers and their pupils, Grades IV through XII. Of other numerous surveys of educational practice, the findings in respect to instructional procedures reflected those of Wilson (111) for New York State and of Strayer (97) for Pittsburgh, that teaching methods frequently follow a pattern of daily textbook or similar assignments and class recitation interspersed with reports and tests; and that where teachers and pupils have departed from this traditional pattern to introduce a variety of informal procedures, more effective results have been usually achieved.

Spradlin (96) studied the history of history teaching and found that the textbook method and the lecture method, its correlate, have been most extensively employed. Donlon (19) made a historical analysis of trends in the methods of teaching history. Methods of presenting geography to the primary child were reported by Barton (6); methods of teaching history in the elementary grades were reported by Reed (91); Bible (7) described methods used in the teaching of high-school sociology; and Cosgrove (15) reviewed the methods adapted to economic geography on the secondary level. Hart (40) found that the *Historical Outlook* and the *School Review* included more research on the teaching of the social studies than any other periodicals.

The Learner and the Learning Process

Anderson's experiment (1) with kindergarten children in play situations showed that domination in one child incited dominative technics in the companion, whereas integrative behavior induced cooperative or integrative behavior in the companion. Furfey (33) reported that delinquency,

though a learned reaction, cannot be changed merely by psychiatric methods. The culture must also be changed.

Relation of attitudes to learning—Harper (38) found the reasons for dislike of history by seventh- and eighth-grade children to be (a) too much memorization, (b) lack of continuity in materials used, (c) dull and uninteresting materials, and (d) knowledge gained unimportant to their own living. Miller (69) reported that there was little relationship between the attitudes of junior high pupils toward history and the teacher and their achievement. Rackley (86) failed to discover any important differences in the attitudes between college students majoring or minoring in history and those not taking history.

Relation of learning factors and abilities—Gillette (36), in three different experimental situations, obtained evidence to show that the fast learner is the better retainer. Wilber (109) discovered that the growth of secondary-school pupils in the factual knowledge of either United States or world history resulted in no greater than normal growth in power to solve civic and social problems. Measamer (67) found progress in reading and literature to have a marked relationship and progress in language usage to have little relationship to success in the social studies on the eighth-grade level. Other relationships and lack of relationships were reported. Douglass and Friedman (20) were able to predict college marks in history and other social studies on the basis of a combination of high-school marks and scores of mental ability. Prediction was more accurate for college history than for other social studies.

Thinking and understanding—Deutsche (18) analyzed children's causal thinking. Causal reasoning developed gradually and continuously and was limited to specific problems, with greatest progress in ages eleven and twelve. Reavis (90) made a study of children's thought processes in geography and showed how instruction could reduce children's errors. Lord (60) investigated the spatial orientation of children in Grades V through VIII. Children confused their "map frame" with their "direct experience frame" and in general associated the cardinal directions with their bodily position at any given time. Pupils in classrooms facing north did best. Eskridge (27) analyzed the processes of growth in understanding of geographic terms in Grades IV through VII. Gabel (34) showed that pupils of Grades VI, VIII, X, and XII comprehended and retained social studies material more effectively when definite quantitative terms were employed. Chakko (12), after analyzing books on educational psychology, concluded that they made no significant contribution to social studies teaching.

The Organization and Presentation of Content

Method as related to organization—Callaway (9) reported that one-third of 114 junior high schools were teaching social studies as integrated courses and an additional one-sixth were planning to do so. Little (57)

showed that the schools not engaged in curriculum development were the ones still using the separate subject approach in the intermediate grades. Freeburg (32) evolved an activity basis for a high-school course in American government. A group of investigators like Jersild and others (50) have found that pupils in integrated programs excelled in certain aspects of social studies such as knowledge of current affairs, social beliefs, and personal and social adjustment. Maier (63) found that the junior high pupils in an integrated program equaled the pupils of control groups in subjectmatter achievement and excelled them in matters of interests and behavior. Hartwig (41) showed that a senior high course integrating Missouri and American history got better results than two separate courses. Farthing (29), with an experimental group of gifted sixth-grade pupils and with a control group of similar pupils, obtained better learning results from integrated social studies than from separate courses in history and geography. Tyler (104) reported that a unified treatment of social studies in the sixth grade resulted in greater learning of spelling than did traditional separate teaching of history and geography. Jensen (49) presented data to show the success of the experimental use of a regional program with local adaptations.

Method as related to the form of presentation—Pratt (82) polled high-school teachers, who ranked the problem method as the best and the formal lecture method as the least effective. Meyer (69) reported thirteen different methods of teaching current events in 113 junior high schools. Cole (14) submitted a chart of activities most frequently mentioned in junior high-school courses of study.

Form of presentation and subjectmatter achievement—McKinnon and Burton's study (61) showed that the use of certain study procedures in the eighth grade gave more improved scores on achievement tests. Wilson (110) compared a directed study plan in history with the formal class recitation, with results in favor of the directed study. In a study on the junior high level, Jones (51) obtained no statistically significant differences between the results of an experimental group having an assignment, study, report method and those of the control group having class assignment followed by study and recitation. Morris (71) found the biographical method with eleventh-grade pupils in United States history superior to the topical method. Grande's matched group study (37), comparing the chronological method with the counter-chronological method of teaching high-school history, showed no important differences. In another matched group study of fifth-grade pupils, Fordell (30) reported an advantage in teaching history by the unit method over the defined traditional method. Fahrney (28), in a comparative study of the lecture-quiz technic and the classroom discussion technic with college students in American history, concluded that the classroom-discussion procedure is better with smaller groups. Douglass and Pederson (21) found for senior high-school history classes the unit method of the Morrison mastery plan superior to the method of supervised study and recitation in a single period.

Form of presentation and general educational growth—Wrightstone and others (117) reported the activity program generally equal on the elementary-school level to the conventional program in matters of learning knowledge and skills, and superior in the attainment of liberal social beliefs, of ability to secure and interpret facts, and of well-balanced personality. Ellwood (26) reported that the recitation method in high-school modern European history was inferior to the unit-directed study procedure in the teaching of understandings and abilities but superior in the teaching of attitudes. Carrothers (11) reported favorable outcomes in the development of attitudes through the use of source units in eleventh- and twelfth-grade social studies. Tracy (101) compared three methods of teaching civics. The pupil-teacher cooperative method proved best in both achievement and personality development. Eichler (25) reported a teaching procedure in the nature of group conferences to be effective in training for leadership in Grades IX, X, and XII. Heise (44) showed the Courtis technic (16), used with Grades V through VIII and XII, to be helpful in the development of cooperative attitudes and behavior. Robb (94) obtained only inconclusive differences in favor of direct teaching over the incidental teaching of character in the three junior high grades. Osborn (77) attempted to determine experimentally the effect of direct teaching of technics of propaganda analysis on eleventh- and twelfth-grade pupils in developing resistance to propaganda. The direct teaching was not effective.

The Use of Printed and Written Materials

Language and reading technics—Harrington (39) showed the direct teaching of the special vocabulary of history to seventh-grade pupils to be desirable. Phipps (81) explored the relationship between the ability of sixth-graders to use history vocabulary in written work and their ability to read history materials. Meighen and Barth (68) described the geographic vocabulary load which third-grade children encounter in their readers. Karrick (52), with 131 ninth-grade pupils, showed, through teaching procedures of detailed guidance and help in the reading materials of the social studies, greater gains than expectancy would justify. Wiedefeld (108) experimented with a plan for developing the history reading readiness of fourth-grade children. Low ability children profited most. Gans (35) established the hypothesis that the critical reading ability required in the acceptance and rejection of material as relevant or not, although having elements in common with general reading comprehension, does differ from the latter in important respects. Keir (53), in her consideration of the various types of skimming, found that intermediate-grade children have greatest difficulty in skimming to locate answers to questions of a different vocabulary from that of the selection. Noel (76) showed that specific instruction on knowledge and skills used in reference work was better for elementary-school pupils than incidental instruction. Stro-

bel's study (98) reported that high-school juniors in their history written work made more errors in all phases of language except diction than in their English written work.

Textbooks—Heintzelman (43) critically examined secondary-school textbooks in modern history published since 1932. He reported a tendency to organize contents on the problem basis. In a rather loosely controlled experiment, Uttley (73) tested six groups of fourth-graders. The one group that had not used a textbook made the lowest score. Wallace's dissertation (106) reported the principal types of difficulties which fourth-grade children experienced in reading their geographical textbooks. The causes of these difficulties were (a) lack of concrete experiences on the part of the children, and (b) lack of sufficiently explicit information on the part of the textbook. Robinson's study (95) furnished evidence to show that history textbooks have been written for grade cycles rather than for specific grades. He showed a sudden and marked increase in difficulty in seventh-grade textbooks. Rutter (93) studied the repetition, spread, and meaning of unusual, difficult, and technical terms in fourth-grade geography textbooks. Quigley (85) compared the reading difficulties of social studies textbooks with those of science texts on the fifth-grade level and concluded that, in terms of both indexes of difficulty and pupil test scores, the social studies books were harder. Ramsey's study (87) attempted to validate a technic for lightening the vocabulary load of geography textbooks. Killins (55) reported that sixth-grade children were unable to read sixth-grade geography textbooks. Traister (102) investigated the effect of a vocabulary simplification of history textbooks on pupil accomplishment in history in Grades IV through VI. Statistically significant gains were secured.

Workbooks—Tryon (103) reported an analysis of 161 workbooks, primary grades through senior high. The workbook as a teaching aid is inherently incapable of being brought into line with recognized good teaching in the social studies. Mead's findings (66), based upon an examination of forty-three junior and senior high workbooks in history, showed that the outstanding general characteristic was the tendency to stress nonproblem-solving activities or exercises. Mead (65) had previously classified the 23,840 exercises in twelve history workbooks to show that the average workbook provided for twenty-five different skills or abilities. The authors of workbooks were not agreed as to which abilities should be developed. Warren (107) compared the workbook in eighth-grade American history with the pupil notebook and found the former inferior in developing knowledge and understanding but slightly superior in developing attitudes. Motter (72) obtained only inconclusive evidence that a discussion-notebook method in eighth-grade social studies was better for growth in factual knowledge than the workbook method.

Other printed materials—Anderson's survey (2) of newspaper and magazine reading among junior and senior high pupils of the University of Iowa showed that the pupils increased their time in such reading from five to eight hours a week as they advanced in the high-school grades.

Harvey and Denton (42) found little teacher guidance of pupils in newspaper reading in forty-four senior high schools. Pupils indicated daily newspaper reading of fifteen to thirty minutes. Levi (56) made a questionnaire study of the reading of current news by pupils of all six high-school grades in a low socio-economic urban section. She reported little relationship between the amount of family reading and student reading. Students read more.

Jamison (48) found on the high-school level no statistically significant changes in attitudes through the introduction of a program of reading historical fiction. The experimental group was helped in the understanding and remembering of factual information in history. Kepner (54) reported favorable results from a fifty-minute weekly library period for recreational reading in United States history with noncollege preparatory high-school pupils. Zembrod (118) showed that the single textbook could get as good subject-matter achievement in fourth-grade geography as extensive reading, and that the greater work and expense of the latter were justified only in terms of attitudes and habits.

The Use of Visual and Auditory Aids

Maps and graphs—Repass (92) reported favorable results in teaching current geography through the use of outline maps. Wise (114) found that special training for sixth-grade pupils in map reading and study gave greater improvement in map use than incidental methods. McLese (62) analyzed the map concepts needed to use a textbook unit in fifth-grade geography. She reported little agreement among textbooks as to the number of maps needed, as to type of map symbols and legends, as to the use of directional and locational terms, and as to the important place locations. Little or no attention was given to an understanding of latitude or distance as expressed on maps. Thompson (100) found that short periods of instruction and drill resulted in greater gains in ability to use maps, graphs, and charts. She showed that proficiency in these skills was associated with achievement in American history. Wrightstone (116) reported that a gradual growth in the reading of graphs and maps continued from Grade VII through XII.

Pictures, slides, and films—Badley (5) studied the relative values of popular picture magazines as collateral material for social studies. Waddle (105) conducted an experiment in the use of stereographs in fifth-grade geography and concluded that, although scores on objective tests of achievement showed no differences, the stereographs induced a more favorable attitude toward study. Peters (79), also with the equated group technique, reported that a variety of visual aids resulted in clearer geographic concepts on the part of sixth-grade children. Park and Stephenson (78) used groups too small to justify any generalizations, but they found that films, slides, and flat pictures made for superior learning with seventh-

graders. Wise (115), in a well-controlled experiment, showed that motion pictures had a high relative value in twelfth-grade history when used as a supplement to the usual instructional procedures Eichel (24), from his investigation, concluded that the film was more effective than the printed page in teaching current affairs. Ramseyer (88) made an interesting and careful study of the influence of documentary films on social attitudes of pupils from all six high-school grades, college students, and other adults. He obtained statistically significant attitude changes for the entire test populations, and these attitude changes remained after a period of two months.

The radio—Atkinson (3) surveyed the uses of radio by American schools and interpreted trends. Taylor (99) studied the use of radio as a teaching instrument in the social studies work of senior high schools. Loder's dissertation (58) reported greater net learning of information from oral presentation with speaker present than from the same presentation given remotely over a microphone, but the latter method resulted in greater retention after forty-four days Cohen (13) found radio broadcasting to be about equally effective with silent reading as a means of teaching information in Grades IV through VIII. In Grades V and VI the radio achieved superior results. Lohmeyer and Ojemann (59) compared the effectiveness of the firsthand account, dramatization, and informal discussion or comment as methods of presenting informative materials over the radio. The discussion method was least effective.

The Use of Community Sources

Knowledge of community—Wilson's survey (111) of New York State indicated a lack of knowledge among the pupils of the six high-school grades about their own communities Pupils in the middle-sized cities were least well informed. Edson (22) reported that pupils of Grades IX through XII in Durand, Wisconsin, showed continuous growth in knowledge of their community, but that they needed a well-planned program of community study

The excursion—Caplan (10) listed the excursions around Philadelphia appropriate for the teaching of junior high-school social studies Noe (75) listed those in Bucks County, Pennsylvania, suitable for the teaching of American history and economic civics. Mason (64) described the field trip program of the schools in Minneapolis Fraser (31) made a descriptive study of the outcomes of a study excursion with twelfth-grade pupils There were reliable gains in information, understanding, skills, and attitudes. Atyeo (4) made an experimental comparison of discussion and excursion technics for tenth- and eleventh-grade classes in ancient history He found that the class discussion, supplemented by excursions, produced the greater gains in knowledge and in interest. Rath (89) reported favorable results from well-conducted, extensive field trips of high-school pupils.

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CHAPTER IV

School and Community Life in the Social Studies Program¹

HOWARD E. WILSON

THE SOCIAL STUDIES PROGRAM, in increasing measure, has to be assayed in its relation to school life and to the social process in the immediate community. Pugh (42) summarized the thesis that education for citizenship demands citizenship within education. The whole area of school and community living as a phase of social education is relatively new, and the research data bearing on it are not numerous. The technics of sociology, to say nothing of educational sociology, are in a pioneer stage of development.

School and Community

The conclusions and materials suggested in Chapter I of this report indicate the changed concept of community and the increased consciousness of the community process now held in American scholarship. Everett and a group of associates (17) reported on the work and plans of specific school systems which have sought to adjust themselves directly and more adequately to the particular characteristics of the communities in which they are situated. Taking the position that the community is a prime influence on the formation of personalities and that the school should analyze its community in order to do its own task effectively and intelligently, Brunner (8) offered specific suggestions on "how to study a community." Cook (12) analyzed with insight the community backgrounds of education. Thorndike (48) presented a "yardstick" for the analysis of community welfare and status. Colcord (11), for the Russell Sage Foundation, prepared a thoroughly useful handbook for school officers on community study, as did also the Georgia State Department of Education (19). Clark, Seay, and Nutter (9) issued a preliminary report on an extensive project involving school study of community problems in housing and nutrition, indicating the marked influence an alert and well-focused school program may have on community welfare. The same indication is found in the report on promising practices in civic education issued by the Educational Policies Commission (37). But the common neglect by schools of immediate and pressing community practices and problems is indicated in the report of the Regents' Inquiry into the Character and Cost of Public Education in the State of New York (53).

Field (18) described the close relationship between a school and an underprivileged urban neighborhood in carrying out reforms in local housing, recreation, and cultural activities. Kane and Kleinfelter (27) reported on successful experience in guiding pupils' study and observation of local social agencies. Adkins (1) described the work of a high-school student council to give support to community projects and secure

¹ Bibliography for this chapter begins on page 463

community support for its own projects. Stabler (47) described a comprehensive community survey carried out by school pupils. Michener (34) reported on a group of thirteen projects in which school pupils in social studies classes participated actively in community surveys and in projects for direct community improvement. In Chapter II of this volume are additional reports on aspects of community study as developed through the use of field trips and excursions.

A major factor in the relations of school and community in the use of community living for the ends of civic education is the teacher's position in and knowledge of the community in which he teaches. In a Regents' Inquiry (53) a rather limited participation of social studies teachers in community affairs was reported. In 1939 Cook and Almack (12) reported on the participation in community life of 2,870 teachers in Ohio, their data have since been incorporated in a wider study by Greenhoe (21). In her study she dealt by questionnaire and case study with a national sample of 9,122 public-school teachers. She reported that teacher mobility is "best described by the phrase 'limited circulation'", that conduct codes for teachers "vary by localities, are stronger in smaller communities than in large cities, are more rigid for women than for men, and are everywhere undergoing liberalization as a result of urbanization"; and that "the picture of teachers as officers or sponsors in community organizations is not impressive. The highest amount of leadership displayed is found in church activities. . . ."

School Life and Civic Education

The school society is made up of a wide variety of subgroups, and the vitality of that society is measured largely by the vigor and health of the groups which compose it. Lewin and his associates at Iowa (29, 30, 31) have thrown significant light on the characteristics and educational possibilities inherent in these school groupings. Using elaborate rating scales based on concealed observation of groups or clubs of young people, Lewin's collaborators found that so-called "democratic groups" (groups in which leaders work cooperatively with followers in the pursuit of commonly established goals) are likely to be socially stronger, with less bickering and disruption, and with higher achievement in actual performance than are "authoritarian" groups. The findings, based on analysis of group functioning in its total pattern, seem applicable alike to classroom groups, student clubs and associations, and student government organizations. In a study of various methods of teaching social studies, Tracy (49) reported better personal adjustments and higher achievement for pupils in democratically organized groups; students of Remmers (44) reported similar values for pupils participating cooperatively in student government. Anderson (4) reported superior personal growth and adjustment for kindergarten children in play groups relatively democratic in character.

A considerable body of literature is available dealing with forms and procedures of student government, but detailed and thorough research is

not extensive. Anderson (3) urged that student government forms and structures parallel those of local, state, and national governmental institutions. Altschul (2) was of the opinion that student participation in school management, even in the elementary school, is conducive to character building. Van Til (50) reported favorably on a situation in which a student council wrestled with the problem of a deficit in student finances. Pederson (39) described the successful practice of a student council in launching and managing a noon-hour recreation plan. Morrill (36) reported a higher percent of pupil votes cast in school elections managed on a party-competition basis. Pitkin (41) urged exchange visits among the councils of various schools. Baker (6) reported the status of student councils in the schools of Illinois, and Grove (22) reported favorably on their values and the extent of their use in the schools of Michigan.

Eells (15) reported on the attitudes of secondary-school pupils toward the number of student clubs, participation in them, and their importance in school life. Keifer (28) presented the reaction of some nine hundred junior high-school pupils to the school-club programs they had experienced. White (52) described the extracurriculum program existing in Chicago schools, and Briggs (7) reported on the organized student activities of one hundred representative state teachers colleges. Pierce (40) analyzed the activities carried on in one high school, and Gibbons (20) detailed the procedures and achievements of a secondary-school international relations club. The report on civic education of the Educational Policies Commission (37) presented a series of promising practices in the entire area of pupil participation in school life.

A procedure based upon analysis of membership, officers, sponsors, club histories, and direct observations was suggested by Smith (46) for appraising school clubs. Zyve (55) also reported a procedure for the more precise evaluation of school activities. Paterson (38) developed a scale, based on Thurston's technic, to measure the degree of freedom and responsibility accorded to pupils in secondary schools.

In a direct appraisal of extracurriculum activities as they existed in schools in 1939 Johnston (26) suggested ten conclusions which seem to be borne out by the general literature. He reported that:

- (1) Many schools have adopted the forms of an activity program without any real understanding by teachers and pupils of the function it should perform.
- (2) We have lacked faith in the ability of pupils to plan, to make intelligent decisions, and to accept responsibility.
- (3) Participation in the extracurricular program has been limited to too few pupils both through regulations denying opportunity to pupils scholastically unsuccessful and through failure to provide for appropriate distribution.
- (4) The competitive aspects of the program have been overemphasized.
- (5) National organizations have often been promotional rather than educational.
- (6) Outside organizations have propagandized in the school.
- (7) The activity program has not been vitally related to the curriculum.
- (8) There has been no consistent effort to evaluate activities in terms of fundamental objectives.
- (9) Teacher-training institutions have failed to provide adequate experiences for prospective teachers.
- (10) Duties in relation to the activity program have not received adequate recognition in planning the teacher's load.

Out-of-School Youth Organizations and the Schools

Sayre (45) has shown the striking similarity in objectives of civic training in the schools and of such organizations as Hi-Y Clubs, Future Farmers, Boy Scouts and Girl Scouts, Girl Reserves, Camp Fire Girls, and church youth groups. There is ample evidence of the need for coordination of the efforts of these groups and of the schools if the civic aims of the social studies program in the schools are to be realized. Monson and Douglass (35) studied the school records and ratings of paired groups of Boy Scouts and non-Scouts. Scouts made somewhat better school marks, were absent fewer days, participated more extensively in school activities, were more likely to be leaders, had fewer juvenile court records, but had no better "citizenship marks" in school. Marble (32) reported with favor on the work of the Boys' State activities carried on by the American Legion. Meyering (34) showed that behavior difficulties beset the same groups of pupils in summer camps as in formal schools. Cline (10) suggested the possibilities in civic education which could be developed by collaboration of schools and the youth hostel movement.

The Training of Leaders

The quality of leadership is critical to a healthy school society as well as to the adult world. Hunt (24) described the need and the problems of educating leaders for a democracy. Hollingworth (23) summarized "what we know about the early selection and training of leaders," giving special attention to high intelligence as a quality of leadership. Zeleny (54) reported a study made to determine the characteristics of leaders in discussion groups, in these groups leadership was positively related to "group participation, knowledge, intelligence, and likeableness." Reals (43) analyzed the home and family background of thirty-seven equated pairs of leaders and nonleaders, he concluded that leaders are more likely to come from favored homes. Hunter and Jordan (25) analyzed leaders and non-leaders on a southern college campus and found many factors related to their status.

"Leadership can be taught," at least in part; this was Eichler's (16) conclusion, based upon four experiments with high-school groups in each of which one group was given instruction in leadership and an equated group was not so taught. White (51) reported a successful class for leaders studying the problems of leadership in school affairs at the high-school level. Atkinson (5) described favorably a class for potential members of a student council. Courtenay (14) emphasized the importance of leadership training in the program of social education by indicating that school leadership tends to persist in later life. She analyzed the college careers and community records of one hundred paired girls who had graduated from one high school between 1922 and 1934 and found a marked perseverance of the activities and qualities of leadership.

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CHAPTER V

Evaluation and Appraisal in the Social Studies¹

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THE KINDS of evaluation instruments needed depend upon the kinds of changes schools wish to facilitate in pupils. The Educational Policies Commission (48) and the Evaluation Staff of the Progressive Education Association (51: 337) recently have made clear-cut statements about the nature of general objectives. The latter classification included (a) attitudes, (b) thinking, (c) work habits and study skills, (d) interests, (e) appreciations, (f) functional information, (g) social and emotional adjustment, (h) creativity, (i) physical health, and (j) a functioning personal philosophy.

The discussion in Chapter I of this issue suggests that the social studies contribute to all the objectives just listed for general education, but especially to the first six and the last named. Because of the close relationship between objectives and lines of evaluation in a given field, the helpful treatment of the latter in the fourteenth yearbook (46: 320-40) and in *The Social Studies in General Education* (51: 342-76) serves to illuminate the former. The same point can be made about the descriptions by Spaulding (63: 18-120) and Wilson (71: 17-107) of evaluation procedures and results in the Regents' Inquiry. A functional analysis of how the social studies contribute to general education reveals much that is valuable but less that is unique. That perhaps is one reason why Lee (39) and Rath (22: 61), among others, argued that the areas in which measurements are made should cut across subject fields.

Developing Evaluation Instruments

Many social studies teachers who subscribe to forward-looking classifications of objectives never make a systematic effort to evaluate the hoped-for outcomes. Their inertia may be the result of one or more causes: (a) failure to make use of other than paper-and-pencil tests, (b) failure to develop a variety of paper-and-pencil tests; (c) failure to use published tests; and (d) failure to develop technical competence in test construction.

Utility of other than paper-and-pencil tests—Jones (37) described seventeen approaches for evaluating the results of a field trip. The REVIEW OF EDUCATIONAL RESEARCH for December 1939 (28) discussed direct observation as a research method, as well as the case method, the interview, the questionnaire, school and community surveys, rating scales, score-cards, and checklists. Interviewers employing a carefully prepared schedule

¹ Bibliography for this chapter begins on page 469.

² The author acknowledges the help of Harnet C. Stull, graduate assistant at Cornell University, in the preparation of this paper.

secured the data used by Bell (9) in writing *Youth Tell Their Story*. Spence (64) described a controlled observation technic as well as a way for assigning qualitative ratings to anecdotal records. Harless (31) suggested how to use observation records of behavior; Eberhart (20), how to use a questionnaire for evaluating certain outcomes of extensive reading.

Paper-and-pencil tests—Tests are used extensively in evaluating (a) attitudes, (b) powers of critical thinking, (c) work habits and skills, and (d) mastery of functional information. Scates (59: 523-26), in discussing the improvement of classroom testing, considered the relation of testing to teaching and the broadened conception of educational objectives, and reviewed the evaluation instruments used in the Eight Year Study. These were also described by Rath (22: 60-79), Tyler (46: 320-40), and others (51: 350-76). Jersild and others (35) discussed the evaluation of an activity program in certain New York City elementary schools. They used a variety of observational procedures as well as more formal tests. Ruch and Orata (28: 521-23), writing in the December 1939 issue of the REVIEW, were somewhat critical of claims made for "evaluation" as contrasted with "measurement." Developments in the testing of attitudes have been reported in various cycles of the REVIEW by Watson (68: 259-72; 66: 276-81), Upshall (66: 298-302), and Traxler (67: 68-71). Not all these studies relate directly to the teaching of social studies in the schools but they, as well as those edited by Remmers (54), have served to acquaint social studies teachers with technics in this field of evaluation. The teacher also might read to advantage the discussion of attitude testing by Bird (10: 142-228). Irwin (33) reported a scale which, by using stereotyped phrases, tended to measure proneness to emotional stereotypy.

The Evaluation Staff of the Progressive Education Association has played a leading role in developing tests to measure aspects of critical thinking (46: 320-40; 22: 60-79, 51: 350-76; 21: 24). Arnold (6) reported using a test in the fifth and sixth grades to measure the ability of pupils to make intelligent use of data. Cook and Koeninger (15) used a similar type of test, among others, in evaluating the outcomes of a college course in sociology. Published tests are being widely used for the testing of basic skills. Wrightstone (75: 207-39) reviewed research in this and other types of objective testing in the Eighth Yearbook of the National Council for the Social Studies, and elsewhere made practical suggestions for testing reading comprehension (74: 369-85) and for using skills tests in the elementary grades (72: 163-64). Collins (14), Jessop (36), and Baker (7) described technics for the diagnostic testing of skills in map reading. Morse and McCune (44) have compiled a helpful collection of test exercises for measuring a wide range of skills. The National Council for the Social Studies has published collections of carefully prepared test items in American (5) and world history (4), economics (3), and American government (2) in order to help classroom teachers construct improved unit tests.

Published tests and competence in test construction—The construction of adequate tests requires a high degree of skill. The principles of test construction have been discussed in issues of this REVIEW (40; 69) and elsewhere (32). Ideally the social studies teacher himself should evaluate various types of published tests. But he should also refer to the information about and reviews of published tests found in the yearbooks edited by Buros (12; 13). During the last year increased emphasis has been placed on teaching democracy. In a recent volume, *Learning the Ways of Democracy* (47: 379-433), the Educational Policies Commission described evaluation procedures used by superior schools in attempting to measure this outcome. See also Chapter IV in this issue of the REVIEW.

Improving Instruments of Appraisal

Brownell (11: 485) emphasized that classroom tests should improve study habits, lead to improved instructional practice, and promote wholesome pupil-teacher relations. Grim (29) developed a technic for measuring attitudes in which a pupil's response to paired statements revealed whether he could distinguish between conflicting points of view. Sletto (60) stressed internal consistency in the validation of personality scales, and Rundquist and Sletto (57) cited the differing responses of groups known to vary in their opinions, as evidence of validity. Corey (17) found a low correlation ($.024 \pm .12$) between the professed attitude of sixty-seven college students toward cheating, as revealed on a questionnaire, and actual behavior in grading their own tests. Pugh (53) found low correlations between the professed attitudes of junior high-school pupils as revealed on scales dealing with phases of school citizenship and ratings of their actual conduct by teachers.

Watson, in the REVIEW OF EDUCATIONAL RESEARCH for June 1938 (66: 276), brought out that the validity of measures of opinions and attitudes depends on the clarity of test statements and the rapport between the examiner and those examined. Roslow, Wulfek, and Corby (55) reported that changes in word content or the serial order of words in questions of opinion significantly affected responses. Rundquist (56) found that in personality measures unacceptable items seem to discriminate better between groups than acceptable; Darley and McNamara (18), that students taking personality tests preferred a personal form of statement.

Suggestions for improving the reliability of grading essay questions through the use of scale samples were made by Wightstone (73). The validation of a test for measuring ability to apply scientific principles by correlating scores on the test with performance on an essay examination was reported by Rath (23). Gans (27) found a low correlation between the scores of pupils on standardized reading tests and their performance on a test designed to measure ability in reference reading. McDowell and Anderson (42) discovered a rather low correlation (.56) between scores on a test of skills involved in outlining and actual ability to construct

an outline. Anderson (1) indicated that pupils able to answer multiple choice items correctly often were unable to supply the desired information on equivalent recall questions. Eberhart (19) constructed equivalent forms for measuring certain social values, one using pictures, the other verbal statements. Maucker (43) reported the development of two forms of an achievement test, "Understanding of Modern Society," which have been standardized in such fashion that absolute rather than relative achievements of high-school pupils can be described

Using Evaluation Data

The organization of this paper does not imply that the studies and evaluation instruments already reported are lacking in utility for such practical purposes as the diagnosis of pupil's difficulties and the improvement of technics and materials of instruction. Limitations of space make it impossible to cite most studies more than once and for that reason the classification tends to be arbitrary.

The use of tests in a supervisory program for the elementary grades was outlined in detail by Cook (16). Prosser (52) described the results of an attitude survey among thirty-four groups in an Ohio community and suggested how the results could be used in a reconstruction of the high-school curriculum. A study by Sargent (58) revealed that the use of emotional stereotypes in a newspaper influenced readers in the direction of the publisher's policy. Smith (61) found that the social attitudes of students more nearly resembled those of their parents than those of teachers or professors, and hence questioned whether instruction in social studies can significantly affect attitudes on basic issues. Murphy and Likert (45, 263-64) also recognized the influence of parents in shaping the attitudes of children. That instruction, by breaking down group stereotypes, can significantly change the attitudes of ninth-grade students toward vocations was reported by Bateman and Remmers (8). In another study, Williamson and Remmers (70) found that attitudes were changed in a desired direction through the use of reading material and that they tended to persist as changed after a lapse of as much as eight months. Lowdermilk (41) found that pupils who had read radio scripts dealing with "Freedom of Speech" and "Rights of Assembly" experienced a significantly greater shift in attitude favorable to those rights than did those who listened to a recording of the material played to simulate radio reception.

A detailed analysis of how the objective of social sensitivity may be evaluated by means of published tests and other procedures was provided by Harden (30). Porter (50) found that high-school seniors overwhelmingly favored democracy and opposed communism and fascism, but that they were poorly prepared to justify their choices. A study by Spitzer (65) indicated that immediate recall in the form of a test is an effective method of aiding the retention of learning. Because recall can fix erroneous concepts, he urged that tests should be promptly corrected and returned or

that pupils should correct their own papers. Sones and Stroud (62) found that when only one to three days had elapsed after original study, testing was a more efficient form of review than rereading; the reverse was true after fifteen or more days had passed.

That definite time, area, distance, and size concepts are easier to learn and remember than indefinite concepts was found by Gabel (26). Eskridge (25) studied the growth in understanding of geographic terms in Grades IV to VII and described the aspects of learning involved. Though historians and geographers were substantially agreed as to the importance of certain geographical features, Lackey (38) found that senior high-school pupils enrolled in a course in American history improved their knowledge of these features but slightly during a year of instruction. Osborn's experiment (49) in teaching resistance to propaganda seemed to indicate that an intensive course of instruction in technics did not insure immunity. He suggested long-term practice in critical thinking as a more promising approach. The discussion by Jensen (34) in Part I of the Thirty-Eighth Yearbook reviewed research relating to the grade placements of concepts, vocabulary, activities, and skills in the social studies.

Many of the studies discussed in Chapters II and III, dealing with methods and curriculum in the social studies, concern evaluation and should have been cited in this chapter had space permitted

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INTRODUCTION

THIS NUMBER of the REVIEW is the fourth one to deal with mental and physical development. The earlier numbers appeared in April 1933, February 1936, and February 1939. The present one deals mainly with investigations published between July 1938 and July 1941.

The scope and organization of the present review have been modified somewhat. Chapters on social-emotional development and on intellectual changes during maturity and old age have been added. The inclusion of the latter chapter acknowledges that the story of intellectual change is not complete with adolescence but involves the entire span of life. The chapters on physical, motor, and mental development are organized so that each one covers the range from birth to maturity. The treatment is to be regarded as supplemented by the issues on "Psychological Tests and Their Uses" and "Mental Hygiene and Health Education," which appeared in February 1941 and December 1940. These issues include mental and physical health, aptitudes, and personality.

In the preparation of this review, as in the preparation of earlier issues on the same subject, it has been difficult to stay within the allotted space. Contributors were instructed that it would not be possible to accommodate mention of every study that has appeared since 1938; they were urged to be selective and to present a critical summary based upon outstanding studies. Even so, with the existing space limitations, it has been necessary to abridge the materials submitted and to reduce the bibliographies to a radical degree. Readers desiring additional references will find them under appropriate heads in the Index Number of "Psychological Abstracts" published each December.

ARTHUR T. JERSILD, *Chairman*
Committee on Growth and Development

CHAPTER I

Social and Emotional Development¹

LOIS BARCLAY MURPHY

IT IS SIGNIFICANT of our deepening understanding of the scope of education that a review of social and emotional development is now included in this publication. The traditional cleavage between cognitive and affective processes or between learning and attitudes toward learning has almost vanished in the last four or five years. Educational implications of social and emotional development have come into focus in such discussions as Prescott's *Emotion and the Educative Process* (129); the Jones, Conrad, and Murphy article on "Emotional and Social Development and the Educative Process" (92); and J. E. Anderson's article on "The Development of Social Behavior" (14). The insight which this approach has developed is becoming particularly active in relation to many chronic educational difficulties, such as those involved in reading. Where formerly we heard frequent use of the phrase "reading disability" we are now likely also to have our attention directed toward the emotional attitudes leading to resistances, fears, or other blocks in learning. The fact that progress is being made in helping children who are having reading difficulties through working on basic emotional problems points to the need for an evaluation of each child's areas of comfortable learning and areas of learning inhibition in terms of the emotional values of these areas to him.

In this review more space has been given to studies which are not yet published or which are published but not in generally accessible form. The writer assumes that every reader of this article can get, if desired, a copy of Prescott (129); the recent publications on adolescence of the Progressive Education Association such as Zachry and Lighty's *Emotion and Conduct in Adolescence* (171); standard texts such as Jersild's *Child Psychology* (89); Klineberg's *Social Psychology* (99); articles in *Progressive Education*, 1940 and 1941, by Lois Meek, Herbert Stolz, and others who are now making research available for teachers in brief and readable discussions, as well as Murphy's summaries of research on problems of social and emotional development in Part III of *Experimental Social Psychology*, revised edition, 1937 (118); and Charlotte Buhler's (35) chapter on social behavior in the *Handbook of Child Psychology*, revised edition.

Hunt's review (87) devoted twenty-seven pages to emotional and social development, with little concern for the genetic picture, since general principles require all the space he had available. He noted that specific, absolute stimuli such as loss of support, loud noises, and restraint of movement (described objectively) have now given way to broader con-

¹ Bibliography for this chapter begins on page 195

cepts such as frustration, novelty, and surprise. Such shifts, he might have added, are part of a widespread interest now in looking at the *meaning* of any stimulus *to the individual subject* instead of systematically ignoring this meaning as was formerly done in the objective approach. Hunt further reported that the present tendency is to view the effects of emotion on learning, not as due to emotion acting immediately on the learning process but rather as attributable to the "distracting" nature of the emotional situation. Emotion, however, should be considered not merely as a possible distractor, which it often is, but as a source of positive motivation in learning, important in selecting what is of interest, curiosity, or pleasure, and what is to be resisted or feared—determining what will be learned by a given learner. Affective processes are also seen in intimate relation to mental activity in Rorschach studies and in such studies as that of language symbolism by Newman (124) or Schachtel's analysis (137) of the symbolism of form in relation to dynamic perception. Relationships between conative and cognitive aspects of psychological functioning are also measured in Abel's studies, especially her studies of modes of thinking (1, 2). We can expect that within the next five or ten years this type of work will result in a systematic reformulation of problems of learning in the context of social-emotional experience in which learning usually occurs and that this reformulation will be able to correct some of the deficiencies of the approaches to learning dominated to this time by a faculty-psychology and intellectualistic approach.

There are, of course, many important publications on the borderline of research, strictly defined, with which teachers and other educators should be familiar. A review of current conditions affecting children, such as that contained in the *Annals of the American Academy of Political and Social Science* (59, 149, 160), November 1940, is of great value. The changing ratio of the number of children to the number of the rest of the population is of great significance for the future social and emotional development of children. A larger number of children will be growing up in families which include old people; a smaller number of children will be growing up in families where children outnumber adults. This change may mean an increase in the type of difficulties which we find in children who spend their formative years in nonchild-oriented families, where excessive restrictions, excessive routine, and excessive demands for conformity to the convenience of adults produce stilted, dependent, or rebellious behavior.

Trends in Recent Research

Wickman's study of children's behavior and teacher's attitudes (167) stands out in the period 1925 to 1935 as virtually the only attempt to consider the relation between the teacher's judgments and attitudes and what went on in the schoolroom. This attempt was limited

to pointing out that what is considered problem behavior is largely a matter of what disturbs the teacher. During the more recent period, teachers have taken a place with parents in sharing responsibility for behavior which appears in a group of children (12). This is the central point of the studies by Lewin and Lippitt (102) on types of authority in relation to behavior of boys in a group. This recognition of the importance of teachers is looked at both from the point of view of its potential destructiveness and its potential release for the child. Members from social work and institutional circles have commented on the fact that the warm maternal interest of a teacher or matron in individual children may in itself have a therapeutic value for dependent, evacuated, and other types of institutionalized children (33). Nursery schools are also coming to realize the therapeutic potentialities of warm relations between teachers and children (20).

Along with this increased awareness of the importance of the teacher's personality has come an increased discrimination regarding authority. There is less talk of freedom with a capital "F," as if it could take care of a child's problems, and more talk of friendly, firm, understanding authority as a prerequisite for sound social and emotional development. Oddly enough the increased belief in some authority has not yet been accompanied by a new approach to the role of verbal patterns in the development of socialized conduct: there is, for instance, relatively little discussion of moral standards, ideals as mediated by parents, school, Boy Scouts, or church. Yet any complete study of social and emotional development of children in our culture would certainly need to include a consideration of the role of emotionally toned verbal patterns in character development.

Apparently those who are carrying on and publishing research have become less interested in description and measurement for its own sake and more interested in the dynamics of origins of behavior and its control. Illustrations are found in the studies of Keister and Updegraff (96) which demonstrate the possibility of changing the child's reactions to failure. The increasing number of studies of frustration and its dynamic relation to aggression may well be contrasted with the earlier descriptive studies of aggression, resistance, and the like (120). Studies of delinquents have moved in the direction of trying to understand the emotional roots of antisocial behavior and the relation of these emotional reactions to other forms of maladjustments such as neurosis and psychosis. This interest in a psychiatric approach to problems which the teachers and the court have to deal with has led to greater awareness of early forms of serious maladjustment. There has been a veritable shower of articles of schizophrenic behavior in children (54).

Reports of mother-child relationships have taken a turn toward a more sympathetic view of the situation in which parents find themselves. While it is still emphasized that children's social and emotional problems are apt to be closely related to parental tension, especially marital maladjust-

ments (19), the attitude is less that of accusing or blaming parents in the manner of "Nineteen Ways of Being a Bad Parent" and more that of looking at the whole family in terms of their needs and problems. This attitude is of course parallel to the tendency to see both parents' and children's difficulties in relation to the cultural context. The depression stimulated this appreciation of parents' problems to considerable extent, since it became increasingly evident that parents without job security could not help but have difficulty in providing for adequate emotional development of children; but this appreciation has been deepened by the increasing *rapprochement* of the social sciences and the readiness of the psychological, psychiatric, and social work groups to learn from anthropologists, and vice versa. Informal contacts with teachers do not indicate that this increased sympathy has become general except where concrete experience with specific family situations has brought deeper insight into the 24-hour "three-ring circus" that marriage, children, and work mean for most parents. The trend is reflected rather in the willingness of educators to look at themselves and at teachers as part of this cultural milieu of the child and as capable of providing some of the basic "emotional vitamins" which the soil must give to children to avoid emotional malnourishment. This willingness has grown from the patient efforts of a few leaders such as Carson Ryan, Mary Fisher, Carolyn Zachry, Lawrence K. Frank, and Dorothy Baruch to help teachers look at their relations to children from this point of view.

As yet the writer has not seen enough discussion of what a child's problem *means to him*. Both from the writer's own research and from discussion with parents it seems obvious that a child's problem behavior often has an indirect rather than direct value for his adjustment. This is exemplified by the behavior of several small boys of varying ages—two of them soil their underwear, one persists in running walls by drawing, two are unconscionably dirty-faced. All of them live in devoted families, and the boys themselves are cooperative, even bordering on the perfectionistic. It seems that these respective misbehaviors serve as a human escape; they demonstrate to the boys that they are not wholly "goody-goody." In one area each is a little devil, even though in all others he is willing to be an angel. Another type of problem behavior which a child has no wish to give up appears in the case of a little girl who was adored and enjoyed it, but her two older brothers were problems and occupied most of her mother's time and energy. Finally, at the late age of three, she took to bedwetting and would not respond to any of the best methods for dealing with the problem. In a projective play situation, playing with housekeeping toys, she shouted, "And the little girl wet the bed, and it's never, never, never, *never* going to be dry." Why should it when keeping the bed wet offered such good competition to the parent time-consuming misbehavior of her brothers?

All the major longitudinal studies of children—the Child Guidance Study directed by Jean Macfarlane at the University of California, the

Study of Personality Development under the Fells Foundation at Antioch College, the Harvard Growth Studies, etc.—reveal the difficulty of trying to understand the social development of an individual child apart from his physical and intellectual development. Studies of this sort which attempt to get a fair picture of “the total child” find themselves veering away from categories which split up the child into different parts and rely upon categories which make it possible to handle the relationships between these different aspects at the same time. Another illustration of the trend toward seeing a two-way street connecting problems of mental and social-emotional development is Preston’s article on the insecurity and other emotional consequences for children who are “reading failures” (130).

It is no small cause for dismay to find so little attempt to evaluate the effect of major social changes like the depression or the war upon children. We do not have at present any adequate data on questions such as the proportion of our children in the United States who are now laying good foundations for later emotional health and social participation. What proportion are now, at the age of five, ten, or fifteen, so badly skewed in emotional and social development that no help can keep them out of a reformatory at eighteen or a sanitarium at thirty or forty? What proportion are in trouble or disturbed, but to a degree which means that adequate guidance now—at the age of five, ten, or fifteen—would result in salvaging an adult personality which might otherwise be lost to delinquency or mental illness? How many of our children are developing basic patterns of feeling and behavior which will make possible happy and constructive social relationships in work and family life when they are adults? Vocational training and preparation for marriage at the high-school or college level will not help if it is imposed upon a base of insecurity, defensiveness, irritability, and competitiveness.

Subcultural Factors in Social and Emotional Development

Subcultural differences must be recognized before we pay much attention to data on development. Differences associated with economic levels have been noted in studies of intelligence tests, but we know little about the patterns of emotional development which differ in different groups. The reading of *Class and Caste in a Southern Town* (56) suggests that the metropolitan pattern of neurosis-building outlined by Horney (84) would call for considerable modification before it could be considered relevant to small-town and rural groups. Hartshorne and May’s studies in deceit, service, and self-control used three check populations of an average eastern near-coastal small-town variety; but it might be asked what connection they would have with a Mennonite community in Pennsylvania, the children of shipbuilders on the California coast, the youngsters who have grown up during the trek of Oakies to the West, or the select young people who attend the “best eastern colleges” after a carefully planned super-

vised education in select preparatory schools. We also need more information concerning, for example, the effect on emotional development of growing up in the "wide open spaces" as compared with growing up in the confinement of apartment life in a big city. It is noteworthy in this connection that Zachry's detailed study of *Emotion and Conduct in Adolescence* (171), based on studies of youngsters in New York, Columbus, and in eastern colleges, has been criticized by western observers of children who feel that the zest, vigor, originality, and exploration of adolescence are left out of the picture and that the worrisome conflicts described by Zachry are, to say the least, completely out of perspective.

Economic and geographical differences are no more important, however, than differences of family tradition. Teachers in WPA nursery schools from different parts of the country report that families of Bulgarian, Italian, and other European backgrounds, not too long in this country, give their children more affection, spontaneous warmth, and vigorous discipline than families of the parent-educated native groups (116). Families in isolated sections, as the Highlander Folk School group in Tennessee reported by Claudia Lewis (in unpublished papers), share a constant companionship with children very different from the bifurcated adult-child world experienced by children in cities. These points—the greater directness of affection relationships with parents, greater contact and companionship, and more clear-cut discipline—are emphasized by psychiatrists and clinicians as crucial to sound personality development. Oddly enough, these values have remained most stable in those groups least affected by pressure from experts either from the medical or psychological direction.

Regional studies of a wide variety of sorts which might be carried on with the help of teachers and school psychologists in different areas might contribute invaluable data to fill some of the gaps. Occasionally there is an article reflecting this type of awareness of specific cultural settings and their meaning for the child's experience. Stott's articles on Nebraska children give us a picture of rural, small-town, and city children in the Middlewest (154, 155). Lewis' forthcoming study gives a picture of Tennessee mountain children. These stand alone except for the Middletown material and that of the Institute for Child Welfare at California, which has as yet made little material available to the general educational public. More studies from different subculture areas are needed to get an adequate picture of social and emotional development in our culture. Within limits we could compensate for this lack of "adequate sampling" on a large scale by careful and critical awareness of the nature of the social-emotional "field" within which the behavior reported has occurred. Therefore, reports on studies of the effectiveness of praise and reproof must be seen in terms of the kind of school situation where the studies were made; children in a progressive school compared with children in a conservative school might reveal different principles of response to these two types of motivation in learning, just as they would show different types of attitude toward

standard competitive lures or bait. Thus the writer has observed that students in a progressive college, where individual projects usually took the place of routine examinations, did not react to a formal examination. The example illustrates the differences in attitude determined by the total field situation which are often not recorded in the notes on "conditions of the experiment" but which are greatly needed. The writer cannot agree with Hunt (87), in his otherwise helpful review of emotion, when he implies that there is no difference between classical stimulus response work and the field-oriented work of Barker (18), Dembo, and Lewin.

Physical Bases of Social and Emotional Development

As a part of the trend toward more appreciation of relationships between physical and emotional development of children in the psychosomatic literature, we find a new awareness of constitutional and birth factors in emotional development. Shirley's article (140), on the later behavior of prematures, is of especial interest in this connection. On the basis of observations on ninety-five premature children, ranging in age from six months to six years at the time observations were closed, she described "the maturity syndrome" which preschool teachers who have dealt with groups of children over a period of years may find familiar. Among other things, the premature child is more apt to be shy and attached to his mother and to appeal for help in difficulty. Attention-span is short and flitting, but he sometimes works to a point of nervous exhaustion on difficult tasks. (Chapter III contains other comments on this syndrome.) Shirley suggests that the fact that birth is often cataclysmic, unduly prolonged, or precipitant might subject the child to birth trauma which leaves a permanent record in the nervous system. The basic fact about the premature child, Shirley pointed out in summary, is that he is in the most literal sense of the term a "sensitive" child. Obviously, such factors are of basic importance for the later artistic, social, and emotional development of children.

Several longitudinal studies based on physical and social observations of large numbers of children are maturing. Evidence from the first ten years of the child guidance study (106) indicates that certain configurations of biological and environmental factors tend to produce a fairly smoothly functioning personality; other configurations produce a disturbed and disordered one. Macfarlane (106) found that it is desirable to recognize the large array of individual differences which "make for differing susceptibilities to stimulation, differing needs and different response patterns." She noted particularly differences "in morphology, size and rates of growth, muscular equipment, nervous reactivity, sensory acuity, energy level, achievements, tensional states." A child who is at either end of the distribution curve has different organic stresses to contend with, and he may develop totally different attitudes and reaction patterns toward himself and then toward others through continuous self-

comparisons with others of the group. Further, the undersized boy will feel differently about his size if his father had been guard on his college football team and expressed high hopes for a son to carry on the tradition than if his father were a teacher who wanted his son to follow in his footsteps. The particular emotional attitudes and relations to other people which grow out of physical differences will depend on other aspects of the child's equipment, the expectations of the people with whom he is associated, the adequacy of family and other supports, and the success of his achievements which do not depend on size.

The total context in which pressures are experienced will largely determine their effects "For example, spinach in front of a child with just his mother present means he merely has to toy at it, spinach plus mother plus father means he has to eat it all promptly; spinach plus father alone means he has to try it at least, spinach plus mother plus father plus brother who is making noises at the table means he may not have to eat any of it."

Among specific hypotheses regarding adaptive responses which the Macfarlane study hopes to check are:

Certain patterns of behavior are more heavily weighted by physiological factors than by situational ones, other patterns are largely habits resulting from external pressures. For example, low energy level and mucus membrane irritability are factors in internalized and withdrawn response. Conversely, high energy level and peripheral irritability (as skin allergies) are important factors in externalized patterning (aggression, temper tantrums). Periods of rapid growth or rapidly altering structure are periods of greater vulnerability—especially the early preschool period and the later adolescent period.

Among tentative conclusions are: No normal child is completely free of adjustive devices that get labelled as "problem behavior," the average number varying during the preschool years from four to six per child. Tempers, fears, jealousy, and oversensitiveness increase to around four or four and one half years and then begin subsiding. Since temper tantrums, fears, and jealousy occur at one age level in more than 50 percent of our children, they cannot be regarded as neurotic behavior but rather as evidence of tension. "Thumbsucking showed zero correlations with other problems and was recruited from the favorable end of the scale on practically all family variables." Fewer problems were found among children of relaxed mothers than of tense ones, speech problems were found most often in families of greater education. The older of a pair of boys is less likely to be secure in social relationships, the younger of a pair is less likely to have confidence about his abilities.

Shirley's and Macfarlane's hypotheses are not to be regarded as isolated instances of the recognition of physical bases for patterns of social and emotional behavior. Stone and Barker's (153) report on adolescent girls presented evidence that the attitudes and interests of premenarcheal and postmenarcheal girls of the same chronological age can be discriminated, and that the postmenarcheal girls show more "mature" interests. Studies of autonomic activity in relation to behavior by Darling (48), Billingslea (26, 27), and Hall's (75, 76) studies of the relation between different expressions of emotionality and the inheritance of emotionality are of importance for our understanding at higher levels. Behavior changes accompanying organic difficulties continue to attract attention from clinicians and

seem to be another potential source of insight into physical conditions underlying various emotional patterns (80).

Social and Emotional Development during Infancy and Preschool Years

Two potentially opposed points of view about infancy have been in the literature: the first may be referred to as the Gesell-McGraw-Dennis point of view which emphasized the biological basis of maturation patterns regardless of cultural pressures upon the infant (50-53, 70). As a matter of fact, Gesell and McGraw are both primarily concerned with patterns of physical coordination which, they have shown, become easily available to the child whether or not he has special or early training in these skills. Dennis is also concerned with the broader gamut of behavior including social patterns such as smiling, which he has shown do appear at normal ages whether the child has little or much social stimulation. "Minimal attention" does not interfere with the basic processes of maturation which underlie the appearance of social and emotional patterns of behavior.

The second is the approach which may be referred to simply as the clinical point of view, since both analytically-oriented and non-Freudian clinicians seem to share it—that all of a baby's earliest experiences, his satisfaction and frustration in feeding, elimination, and early motor experience, whether he is loved or rejected, whether he is handled casually or tensely, may be reflected in the structure of his social and emotional behavior as a growing child and later as an adult. Margaret Mead has aptly offered the concept of "cultural plot" to refer to the pattern which emerges from the typical frustration and gratification experiences of a child in any given culture in his contact with the family and community structure.

Actually, these two approaches are not in conflict, for the second begins where the first leaves off. The innate pressure to mature may produce during the first six or eight months of an infant's life the raw material (smiles, cooing, babbling, reaching) of social response; but the type of social personality which a given infant develops is dependent upon the total pattern of social and emotional experience. Studies of isolated, excessively deprived, or "wild" children continue to testify to the more dramatic results of distorted early experience, and the various longitudinal studies referred to previously will shortly produce detailed material on normal results of normal differences in early experience. Levy's work on maternal overprotection and also that on affect hunger are concerned with results of certain typical kinds of limited experiences of a young child (100, 101); in the first instance, overloving and overguidance of the concerned mother; in the second instance, the basic loss to the child who experiences inadequate love and contact, with resulting remoteness and inadequacy in his own contacts with both people and objects.

Closer to the Gesell-McGraw school is probably Shirley's work (140) which substantiates Washburn's (163) emphasis on the continuity of individual patterns of social and emotional response in infants. Shirley is the last to ignore the importance of social conditioning at any level, and this fact lends weight to her evidence that each baby retains his own core of recognizable selfness. Her interest in uncovering some of the congenital syndromes which might account for these individual continuities probably gave rise to the study of the syndrome of sensitivity which she found in premature babies.

The extent of influence of early experience may not be confined to tendencies to be irritable and tempery; learning attitudes also are believed by some clinicians to be rooted in broad orientations established in infancy. That is, an unsatisfying experience with food in infancy might result in a general negative attitude toward all "taking-in" experiences, including that of taking in knowledge. Early experiences in confinement in cribs and playpens may condition later attitudes toward constraint and confinement in the school situation; early pleasure or frustration in connection with order, routine, and organization may well underlie later attitudes toward orderliness and organization. Nevertheless, however the twig was bent in the first months of life there is considerable opportunity for further direction of its growth before adolescence, and it is the teacher's job to discover what kind of guidance a given child with his individual pattern of satisfactions and frustrations can take.

A third approach which builds on both of the first two is that of Erikson (62), who deals with the emotional consequences of frustration or shock which come at critical points in the child's maturing. Thus, if a child is just learning to talk or to walk, this most recently acquired activity is most likely to be disintegrated by the shock experience and to result in stuttering in one case, awkward coordination in the other. Proper rate, normal sequence, and undisturbed opportunity are important conditions for optimum development of all functions. These conclusions undoubtedly spring from Erikson's study of embryonic development, during which "each organ has its time of origin and this time factor is as important as the place of origin." If the eye does not arise at the appointed time, it will never be able to achieve adequate development; also, if an organ has once "arisen successfully from the anlage" it may be lamed or runted, but its nature and actual existence can no longer be destroyed by interrupting the growth. The organ which "misses its time of ascendancy" is doomed not only as an individual but it endangers at the same time the whole hierarchy of organs; normal development implies the "proper relationship of size and function among the body organs."

In the sequence of "developmental habits" which are the expression of changing aspects of bodily growth and increase in ability to perceive, to touch, to grasp, to master, to make social contacts, Erikson states that the child "can be trusted to obey inner laws of development, . . . which in his prenatal period have formed one organ after another, and now (as

those organs search out reality) create one behavior item after another." Each newly emerging kind of spontaneous activity brings with it its own impulses; sensuous satisfactions in expression of the impulse; a variety of channels for release of the impulse, and exploration or experimentation with its possibilities; fantasies of fulfilment, and intolerance toward frustrations, defenses against the impulse (reaction formation) and sublimations. Many developmental habits "such as sucking and biting mannerisms, finger-play involving hair, nose, etc., body-rocking, head-banging, wetting and soiling, spitting, smearing, motor restlessness, masturbation, speech mannerisms, lying, etc., become fixed under the influence of unresolved anxiety, i.e. become compulsive habits." If they then are broken, "neurosis or character deformation through excessive inhibition can result." Emotional crises arise when several threats to the child's adjustment occur at the same time and succeed in crushing his defense system. Such threats may be: (a) changes in the body brought about by growth, maturation, or sickness; (b) changes in the environment such as a birth, death, sickness, moving, change of nurse, estrangement between parents, or financial worries; (c) changes in the person's conception of his psychological status in the world.

It is well known that over 50 percent of nursery-school children show some of the common problems at one time or another and that thumbsucking, enuresis, hitting, and tempers are assumed to be normal unless they persist unduly after the preschool age (82). Recent studies from the academic side have attempted to cut deeper than the standard descriptions of social behavior. Stimulated by the results of his factor analysis of Berne's list of behavior items, Williams in collaboration with White (166) has made a study of approach-withdrawal patterns which may underlie several segments of behavior. Fite (65) was, the writer believes, the first to try to approach the child's point of view in studying aggression, and vividly illustrated the dilemma of the child confronting parental prohibitions against hitting at the same time that he must learn to defend himself. This is one of the most interesting monographs for the teacher or layman that has ever come from the pen of dissertation writers. It would be interesting to know to what extent aggression in nursery-school children is a product of the situation created when twenty-five socially immature youngsters are grouped together before they have had an opportunity to learn the rudiments of sharing, tolerant permissiveness toward the explorations of others, and respect for property necessary in our culture.

Murphy's study (119, 120) showed that sympathetic behavior went along with aggressive behavior as a normal phase of the responses of preschool children to other children, and that it varied in different groups depending on the attitudes and examples of teachers, the amounts of competitive pressure in the group, and the interpersonal relations stimulated by the age-structure of the group. The importance of teachers' personalities and behavior for the behavior of children in a group comes into focus in H. H. Anderson's studies of dominative and integrative behavior of kindergarten teachers (12).

Conn's reports of children's reactions to the discovery of genital differences present voluminous illustrations that many children take the discovery of sex differences casually and without emotional disturbance (43, 44). Levy (100), however, with equal or more extensive experience, questioned the validity of Conn's interpretations, pointing out that since Conn's material was largely based on retrospections at the age of nine to twelve, plenty of time for repression and assimilation had elapsed, and that this kind of material is not adequate to prove Conn's point.

Dynamically, the preschool period is still extremely flexible, so that it is a fruitful period in which to watch the effects of controlled social stimulation and emotional bolstering. Training in specific skills, planning for success and for amounts of failure which can be emotionally handled by the child, and putting the child into situations in which he is superior can all help to reduce chronic shyness, inadequacy feelings, and excessively emotional reactions to failure. This kind of guided development of confidence during formative years may help to prevent serious anxieties later. The preschool child is also more accessible to catharsis of conflicts, which might be severe and repressed to a point of requiring long psychiatric treatment some years later. There is need for more awareness, on the teacher's part, of the possibilities of active help of young children.

Patterns of Feeling and Thinking Rooted in Personality Structure

Even with its flexibility, the preschool period is one when social and emotional orientations take definite form related to personality structure types. A group of children who have been observed and tested through a period of from two to four years beginning with their entrance to the Sarah Lawrence Nursery School are showing that overt behavior may change rather dramatically but always within a clear personality structure which maintains its own individual form and direction as seen in Rorschach tests, painting, and other projective tests. Lerner has found that play experiments designed to bring out patterns of ego-development often reveal, in miniature, patterns which emerge clearly in the group situation weeks or months later.

Murphy finds that social-emotional orientations manifest themselves in children's play with Miniature Life Toys, plastics, and sensory toys. tendencies to be rigid or flexible, conformist or defiant, original or stereotyped, are reflected not just in the social behavior or the character of a child's constructions, but throughout his activity, with certain significant variations in areas of constraint and areas of freedom important for the pattern of emotional development of the individual child.

We may throw the development during the preschool period into relief by contrasting the child at two and at five. The independence from his mother at the later age indicates a new emotional development sometimes expressed in open rejection of her, or even phrases such as "I don't like you any more." This emotional development with its social concomitants

has so far been described only in concrete observational terms, and no systematic research study has been made, to our knowledge, of the transition from dependence on mother to a less dependent role. Yet it is reflected in such research experiences as the rejection by five-year-old boys of the Miniature Life Toys with which they played happily a year before and will play happily a year or so hence after they have gotten over being so defensive about their roles. The parallel development in girls consists in heightened interest in dolls and housekeeping, dressing up like a lady, and less attention to the block-building, car-pushing activities which they shared with boys the year before. With girls a little element of withdrawal, decreased aggression may be present, coordinate with the increased verbal aggression of boys who have achieved an identification with a masculine role.

At the elementary-school level, studies of emotional attitudes in relation to educational development have recently been focused on reading problems. Preston (130) calls our attention to the deep insecurities which may result for the child who becomes a "reading failure"; and teachers have become alert to the relation between sibling competition or other family tensions and the child's academic progress. Liss (103) recently presented papers which looked at the basic educational attitudes of the individual as part of his total emotional and personality development. An unpublished study carried out under grants from the General Education Board to Sarah Lawrence College and the Commission on Adolescents of the Progressive Education Association pointed out certain basic life patterns which affect learning: the overconscientious girl student who demands excessively rigid standards for herself to the point of blocking the possibility of getting spontaneous insights, and whose social life is overshadowed by the same drive; the quiet, feminine girl whose basic values may be domestic or social and for whom intellectuality has no appeal, the scattered, overactive students who through accumulated insecurity or early trauma are unable to focus and organize either their social life or their work. In each of these instances, basic life patterns established along broad lines direct the quality of social and emotional attitudes of the student's whole life, including her apparent capacity to learn, organize, analyze, and otherwise carry on her studies effectively.

Some studies have concerned themselves with the relation between the intellectual content a student can deal with and the emotional drives which have come to characterize his present stage of development. A student involved in conflicts with parents, and rebellion against inadequate love, rejection, or excessive control, may reflect the dominant mood of this emotional life in hostility in writing, use of strong contrasts, violent language, enjoyment of aggression in reading material, as well as qualities of tempo, disorganization, and lack of conformity to authoritarian demands of the institution.

Social patterns in a relatively free school situation among seven-year-olds are described by B. Biber and others in an unpublished study. Social

interplay was found to differ according to the relation between each individual child's needs, identifications, areas of ease or insecurity, and the suitability of one or another activity in serving these needs. At this age level, certain children tended to use all the work situations as social opportunities. This study reveals in considerable vividness the interplay of many factors. There remains the question of evaluation and philosophy. The reviewer has not seen any evidence that any school has made a careful analysis of the types of work situation which will elicit or stimulate attitudes desired by the school authorities in this country. There are reports that Soviet education includes precisely this kind of planning for the development of cooperative social attitudes. In progressive schools in this country the adults have professed to a policy of omitting competition as an incentive and of trying to give each child the feeling that he may proceed at his own pace. In spite of this official philosophy, competition is not absent from the social behavior of the children. In the study cited previously, there were children who seemed quite incompetent while others seemed to have needs too deep to permit behavior to reflect solely the noncompetitive school atmosphere.

This study by Biber has all the advantages and disadvantages inherent in an intensive study of ten children from a relatively homogeneous subculture. Studies carried out by investigators with a different frame of reference might throw light on many aspects of the "latency period" which is brought to our attention too little. Rorschach studies point out the "prepubertal constriction" which appears in Rorschach records. For some time the greater amount of research time given to preschool children and to adolescents could be laid to the difficulty in studying children at the elementary age; but research methods of the observational, experimental, and projective types have developed so rapidly in the last few years that there is no longer any excuse for not acquiring a deeper and wider grasp of social and emotional development in the elementary-school period. We may take a few leads from clinicians who have shown us that imaginary companions (24), detective stories (39), and the widely current comics (23) meet real and important emotional needs in school-age children and deserve to be understood instead of being ignored or repressed by moralistic adults. If we ask the single question, What emotional needs underlie this elementary-school activity? our attention will be led more sympathetically to the developmental problems of the child of this age.

Adolescence

Literature on the adolescent continues to be the most prolific and the most easily accessible, with volumes on vocational problems, emotional problems, and conduct achieving commercial publication where similar studies on earlier age levels are confined to journals that seem obscure to laymen and teachers alike. In some ways it seems unfortunate that this is the case, since most professional workers with children, whether

they work in schools, clinics, or courts, are increasingly coming to feel that problems which emerge in adolescence are simply the end result of trends in emotional response which were becoming consolidated during the preschool and elementary-school periods. The most intensive studies of adolescents are the ones carried out in California on children ten to sixteen years old and the study carried out under the Commission on Adolescents of the Progressive Education Association, largely in the East. The western study emphasized the relation between physical changes and the child's relation to his group; changing roles in the group resulting from changing rates of physical growth; and changes in confidence or adjustment following these changes in role. A shy, bookish girl of ten blossomed into a lively and gay socialite when the consciousness of early sex maturing and attractiveness to boys gave her new confidence; a popular leader of girls' sports at ten quieted down into a withdrawn wallflower when her leadership was no longer in demand, and her athletic, boyish figure was less attractive than the rounded bodies of more feminine girls. An active ten-year-old boy became a difficult problem when slow physical maturing left him "out of the swim" of social activities of the thirteen-year-olds.

In this California study, the children's efforts to gain security and to grow up in their social group are seen to be a major concern from twelve to sixteen. In the eastern study, not so many children have the early social freedom which the western children have and the reports seem to be more concerned with inner problems and anxieties. Worries about weight, menstruation, work, and relations to family all appear in the final picture but with considerable emphasis upon the child's feeling about his changing body and his changing self, his sex role, and adequacy. Doubtless, the difference in method between these studies accounts for part of the difference in emphasis on results, since the western study was based on observation of children in group activities, on tests of adjustment and attitudes, and on physical and mental measurements, while the eastern study was based largely on interviews supplemented by tests. Both are too important and extensive for any comment here to be adequate and should be classical for years to come.

Even such careful studies as these, however, do not deal adequately with the adolescent's experience in clubs, church organizations, and other institutionalized groups. An occasional study of Scouts may be found. In view of the large proportion of young people still in the churches, in spite of the increasing chasm between intellectuals and the church, it is obvious that we need to know and understand more of the adolescent's need for spiritual nourishment.

At the college level, we find Newcomb's study (to be published) of changes of social attitude in Bennington girls, in the direction which would be expected in a liberal academic environment. Sarah Lawrence is presenting a series of studies around the theme of emotional patterns in relation to learning. Abel's study of modes of thinking (2), char-

acteristic of individual students and teachers, is in the same direction, though based on observations of secondary-school children. She suggests that educational planning might well take into account a child's need to study both with a teacher who thinks the way he does and with a teacher who has a different pattern of thinking, to broaden his base. These are examples of the trend observed earlier in this review—to look at problems of learning in a wider setting, and especially in relation to the specific attitudes and intellectual-emotional patterns of response which direct a given child's learning. Further understanding of these problems is needed before we can know to whom logic, science, or art can really be taught, or why it is easy for one child to share our liberal objectivity and impossible for another to do so.

Methods of Study

In the field of emotional development the most striking emphases in the last three or four years have been those centering around the study of emotional reactions in relation to personality. Personality tests for elementary-school children have been increasing in number; some of them (22) follow lines originally laid down in the tests for adults, such as the Bernreuter inventory; others have developed along new lines suggested by a study of children themselves. This trend amounts to a bringing into the realm of the teachers and the school, methods for studying adjustment formerly confined to the college and adult level.

A similar extension into the field of study and guidance of normal school children of methods originally developed in the special field of psychiatric work has taken place in the use of play technics originally developed and described by clinicians of psychoanalytic orientation. We now find descriptions of play technics for studying the emotional patterns of normal children as well as play technics used in therapy of children with difficulties. Projective technics need not be confined to a few formally planned technics applied to get at the emotional concerns of individual students. Everything or anything a student does may be regarded as a "projective datum," just as it may be regarded from a moral or legal or educational point of view. Any teacher who knows how a student is spending his time, his work habits, his relations with people, the kind of thing he reads in leisure time, how he reads assignments, and his behavior in class and in the dining room has "projective material" out of which to build a diagnosis of the student's basic attitudes and emotional development. Specific fantasies may be more important to obtain in the case of some students than others and may or may not be needed depending upon whether paintings, drawings, doodlings, line of gossip, and other spontaneous responses are accessible. All these data may be approached with a tool like Murray's list of "needs and press" (121) or, more casually, with an attempt to discover the persistent drives, defenses, and compensations which make the pattern of attitudes. It is not within the purview of

this paper to discuss to what extent this should be done and to what end.

The possibility of accurate diagnosis of emotional difficulties seems to be coming closer to reality in Munroe's study (to be published) of the modification of the Rorschach for use in testing large groups. Tried on college freshmen, the method gave better results than the Bernreuter Personality Inventory.

The use of art technics is similar to that of play technics for studying children's emotional attitudes. A certain amount of comparative material based on drawings from individuals of different cultures gives a broader base for our understanding of the art materials than we have for play, since most of the play technics involve the use of specific objects such as dolls, housekeeping materials, vehicles, etc., many of which are unfamiliar to children of primitive cultures, otherwise accessible for comparison. Space does not permit discussion of these methods of studying emotional patterns in children, but for those who may be interested a number of illustrative references are given in the bibliography (7, 8, 55, 60, 62, 94, 117). The reader should also see the review of projective technics by Ruth Strang in the December 1940 issue of the REVIEW.

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CHAPTER II

Mental Development from Birth to Maturity¹

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THE NORMATIVE APPROACH to the study of child growth and development is still used extensively, but there also seems to be a growing realization that the factors that cause or influence particular outcomes must be studied and assessed. New techniques and methods of research are being developed and the relatively intangible aspects of growth explored. The need for new evaluative procedures, including the statistical, is becoming increasingly apparent as the problem of patterns of development is commanding greater and greater attention.

Growth Studies

At Antioch College the Samuel S. Fels Research Institute is following 130 children from conception through adolescence (193). The work of the Yale Clinic of Child Development is published in a series of notable articles and books (63, 66, 67, 68). A recent publication (44) summarizes the outcomes of the Third Harvard Growth Study. The Fourth Harvard Growth Study (210) was begun by Stuart and his associates in 1930 and deals with children from birth on. The Berkeley Growth Study, which also deals with children from birth on, is summarized by Jones and Bayley (104), they include a helpful bibliography of thirty-seven titles. Macfarlane (132) has reported on the plans, methods, and techniques used in the Berkeley Guidance Study. Blatz has reported studies of the Dionne Quintuplets (18).

Early Development

At the lower age levels it is extremely difficult to differentiate the various components of the behavior entity; indeed, the younger the child the more diverse the activities conventionally included under the category "mental development." Various aspects of early development have been studied by several investigators (8, 10, 15, 45, 46, 63, 65, 66, 122, 244). It seems clear that the earlier the developmental period studied the more stable are the growth factors involved and the less we know of their nature and role. Certainly branding them "maturational," "autogenous," or "relatively little influenced by experience" does not solve the problem.

Intelligence tests for the young—P. Cattell (31) has published a downward revision to two months of Form L of the Stanford-Binet tests. Gesell's "Developmental Diagnosis" (66) deals with the assessment of behavior patterns and growth trends from four weeks to three years. The revision

¹ Bibliography for this chapter begins on page 519.

of the Stanford-Binet scale (216) extends measurement down to the two and one-half year level. Nelson and Richards (154) have determined mental age values for the Gesell Schedules using assumptions of similarity of function and constant coefficients of variability. "Projective" and "Play Therapy" technics were referred to in Chapter I of this issue. Motor development is more fully treated in Chapter V.

Prediction of Mental Growth in Infancy

There seems to be general agreement that, except in cases suffering from gross abnormalities and severe developmental accidents, the infant at birth is poorly differentiated from the group. There is also substantial agreement that the greatest irregularity in rates of growth in mental abilities occurs during the early developmental period when development is most rapid (10, 11). Opinions differ as to when fairly stable differentiations appear, but most authors are agreed that future mental test score is not accurately predicted by tests now available for children under two years of age (6, 8, 11, 29, 44, 88, 90, 154, 155). Anderson (6) has made a critical evaluation of infant and preschool tests. Hallowell (80), in trying to ascertain how early in the life history of an individual a relatively stable IQ can be ascertained, stressed the need for using all available data in making the evaluation. Some test items have greater predictive value than others. The problem seems to be complicated by the varying functions tested at different age levels.

L. Dewey Anderson (8) found that a combination of three-, six-, nine-, twelve-, and twenty-four-month age scores correlates .64 with intelligence at five years. Tests given at six months and at eighteen months show a different correlation with later intelligence than those given at nine or twelve months. Nelson and Richards (154, 155) found, among other things, that some individual items at six months correlated better with later IQ than total test scores. A factor analysis of seventeen items passed by 25 percent to 75 percent of the subjects at six months yielded tentatively three possible factors—alertness, motor ability, and testability or halo. Factor analysis of tests at twelve and eighteen months yielded at least two factors—alertness and motor ability.

The low predictive value of tests in the early developmental period has been explained in several ways: (a) It has been held that the early tests are largely motor tests. (b) It has been pointed out that "mental organization changes with growth and that the rate of change is especially rapid before two years of age" (11). (c) It is apparent that direction, rate, and pattern of growth are, for the most part, unknown under the usual testing conditions, although knowledge of these factors is essential for accurate prognosis. (d) It is becoming increasingly clear, too, that the pertinent environmental variables must be evaluated accurately and that their influence varies with the age of the child, increasing markedly from birth through the preschool period (12, 89).

Rate of Mental Growth

Freeman and Flory (60) obtained data for the same children over a ten-year period and found that individual differences with respect to the rate and form of the growth curve were very large. In a later report by Freeman (58), the variability of rate of growth was further emphasized by data showing that the rate varies at different ages in no predictable manner. Gesell (64) in a case study of several subjects selected from a group of thirty children reported that the course of mental growth did not appear erratic and highly variable, although each child tended to exhibit a distinctive growth pattern. However, Bayley (11), in a study of sixty-one children tested from the time they were one month of age, reported individual children showing variable rates of growth. From her analysis of growth curves she concluded that mental organization itself changes with growth and that such factors as tests requiring different mental functions at various difficulty levels complicate the interpretation of growth curves.

Pubescent changes and intelligence—Stone and Barker (207) compared the Otis Intelligence Test scores of 175 postmenarcheal girls with those of 175 premenarcheal girls. The girls were paired for chronological age, personality, and socio-economic status. The mean score of the postmenarcheal girls was 2.25 points higher than that of the premenarcheal girls. This difference was not considered statistically reliable. In a more recent study it was observed that the mean IQ of the pubescent girls was from .5 to 5.0 points higher than that for the prepubescent. The differences are from .28 to 2.34 times their standard error; however, such differences were accounted for on the basis of a selective factor that entered into the study (208).

Cessation of Mental Growth

Wladkowsky (253) noted that mental defectives showed a more rapid growth before the age of fourteen than after this age. There was, furthermore, a tendency for the IQ to decrease after the age of sixteen. The curves of growth show a slower ascent after the eleven-year age level. Somewhat in harmony with this are the results that have been obtained from experiments on logical learning and retention with meaningful verbal materials. The review by Welborn and English (232) included a bibliography of eighty-three titles. The conclusions reached were that such retention showed a decided increase from early life to puberty, with a slower increase after this period of life. The results obtained by Freeman (59) from applying a composite mental test to several hundred children have been verified by subsequent research. He pointed out from growth curves plotted from age eight until late adolescence that "(1) the intellectual growth curve diminishes only slightly in rate from 8 years to 15 or 16 years of age, (2) intellectual growth continues at least to 20 years and probably

beyond" (59, p 34). Terman and Merrill (216) have suggested from their studies that the amount of mental development during the first several years of life is much greater than that of later years. They point out that the amount of development between three and four years of age approximates that between six and eight or between nine and twelve. There is evidence, however, from individual growth curves that there is an individual variation in the rate and limit of development.

Effect of Environment on Intelligence

During the period covered by this review many additional studies dealing with the effect of environmental conditions have appeared, culminating in the Thirty-Ninth Yearbook of the National Society for the Study of Education. It is not possible to summarize here the extensive data presented. The reader is asked to turn to the Yearbook and the critical analyses, especially of the Iowa Studies, which have been reported by McNemar (138, 139), Anderson (6, 7), Goodenough (72, 74, 75, 76), Simpson (185, 186), and others; and the replies by Stoddard (199, 200, 201, 202, 205), Wellman (236, 237, 239), Wellman, Skeels, and Skodak (241). One may also be interested to read the comments from the "side-lines" by Saucier (181).

To assist in interpreting the data it may be helpful to summarize the major framework into which the studies and arguments fall. First, what is the question at issue? In the past, studies have sought to find the relative contributions of heredity and environment. This purpose is not characteristic of the studies of the last three-year period. There is a growing conviction that relative percentage contributions are not meaningful. Some of the studies of the past three years have rephrased the question somewhat in the form, "Given two groups of children of equal IQ at a given moment, what will happen when these two groups are placed in radically different environments?"

Second, what are the major problems of experimental technic? These issues have made most of the literature and are somewhat lengthy.

1 In studies continued over a period of time it is difficult to avoid the dropping out of subjects. This introduces a variable as McNemar (138, 139) has well indicated. However, the data can be presented in such a way as to show the results for the constant group as well as for the total group. When the data from the Iowa Orphanage Project (241), for example, were analyzed to separate out the constant group, it was found that the 21 experimental and 22 control children who remained 400 or more days showed growth trends similar to those of the total group.

2 In retest studies there is a tendency to report the data by cases at each test period rather than in terms of the same individuals at successive test periods. McNemar (138) reanalyzed the 40 cases of experimental subjects and 65 controls in the Iowa Orphanage Project according to individuals in each group and showed that the critical ratio of difference reduces from 4.2 to 2.2. This is a valuable point. On the other hand, the same scores were divided by Wellman (241) into those above 80 IQ and those below 80 IQ in the initial test. Those above 80 IQ in the control group lost 15.6 while those in the experimental group lost 2.2 giving a difference significant at the 1 percent level. Those below 80 IQ in the control group gained 4.2 IQ points while

the preschool group gained 82 IQ points. The increase of the differences between the two groups at each time that they were tested shows marked consistency.

3. Intelligence tests are not sufficiently reliable so that statistical regression can be neglected. This is also an important point and must be taken into account whenever subjects are divided into high and low groups and no control groups are used. Statistical regression, however, cannot be used to account for significant differences when matched experimental and control groups are used. Also, it does not explain the shifting of means when total groups are considered. When those portions of the data in which statistical regression has not been taken account of are excluded, there remains a sizeable residue of matched group and total group comparisons.

4. Several writers have pointed out that intelligence tests at the lower age levels are not as reliable as those at the later age levels. IQ's computed for two- and three-year-old children are not as reliable as those for eight- or nine-year-old children. Also, Anderson (7) has raised the question as to whether "terminal measures" of intelligence should not be used in development of intelligence tests. However, the reliability of the lower age levels of such tests as are available is not zero and some confidence can be placed in the scores. Goodenough found a reliability of .81 for the Kuhlmann-Binet test between examinations given four weeks apart. Bayley (11) also reported coefficients in the low eighties at ages over twenty-four months. Furthermore, several years have now passed since the first measures were taken in such studies as the Skeels-Skodak (187, 189) investigation in which a fair proportion of young children were used, and data recently reported by Stoddard (200) provide remeasurements of the same children at a mean chronological age of nearly eight years with a range from five to twelve years. The results are essentially the same as those reported in the earlier Skeels-Skodak investigation.

5. In some studies, scores for two different tests such as the Kuhlmann-Binet and the Stanford-Binet are mixed indiscriminately. The effect of this can easily be shown by analyzing the data for each test separately.

6. In studies of foster children involving the measurement of foster parents, it has been pointed out that tests given to illegitimate mothers may not be reliable because of the emotional stress prior to or following birth. However, usually there is opportunity to observe the mothers in situations other than the test situation and this has led the investigators to compare the intelligence quotients as found by the examiners with behavior in other situations. Such additional data can provide a partial check on this point.

7. In estimating the intellectual level of the true parents of foster children, the use of sixteen as a maximum divisor for computing the adult IQ has been questioned. The use of sixteen as a maximum divisor was recommended by the authors of the Stanford-Binet tests, but since this has been questioned we should have more data as to whether or not the practice should be changed. Also, it has been stated that the educational level of the true parents is practically as high as the level of the general population. Such data as are available are not sufficient to establish the average educational level of the general population either for the country at large or for individual states. All that can be done is to use the best estimates now available and await results of further investigations.

8. It has been suggested that there may be a selective factor in the studies of the foster children, since only those for whom applications for adoption were received are included. This would seem to indicate that generalizations must be restricted to the type of subjects studied until further data are available to indicate what effect, if any, such a selective factor may have.

Dangers of Overgeneralization from Studies

In addition to a clear recognition of the question and the problems of experimental technic, it is necessary to point out the dangers of over-

generalization. Overgeneralizing in the nature-nurture question appeared long before the recent controversy. For example, in past years studies have been made of the growth of twins reared in different environments. If identical twins reared apart yielded a rather high correlation in factor "A," it was concluded that inner forces determine factor "A" and that environment has little effect. Now it must be noted that if the term "environment" has its usual meaning it means "any environment." But in a given study usually only two environments were tested out and compared. What would happen if a third environment radically different from the other two entered the picture? If height is the characteristic in question, what would happen if we set up an environment containing a diet loaded with hormones influencing growth? This is not beyond the realm of possibility as indicated by some of the discoveries of nutrition in the last third of a century. In other words, generalizations must be confined to the environments actually tried out and cannot be extended to *all* environments however different they may be constructed now or in the future.

This caution in generalizing applies to the studies under review. Investigators in different parts of the country have tried out the effect of pre-school and special school attendance on mental growth. Wellman (240), Starkweather and Roberts, and Thorndike (in part) (224), Skeels, Wellman, Updegraff, and Williams (188) have reported such environments as producing gains in IQ. Anderson, Bird, Goodenough and Maurer, Jones and Jorgensen, Voas, Olson and Hughes, Lamson, Pritchard (citations in reference 151), Horan, and Hollingworth (170) reported no effects of the preschool environment or of special classes in school. If we count number of investigations, there are more showing no gain than otherwise. On the other hand, Stoddard (201) has summarized data showing that if we consider number of subjects, far more subjects have been used in the studies showing gains than in the studies not showing gains. However, the fact that a given school environment did or did not produce a change in IQ does not allow the generalization or expectation that all school environments will do the same. It is quite conceivable that one might obtain results such as those reported by Thorndike and others (224) in which one and perhaps two of the three environments showed a change and one definitely did not. Preschools and schools, like families, differ, and terms such as "the preschool," "the activity school," and "the family" are relatively meaningless unless further described and classified. This need for careful description applies to both the control and experimental environments. Also, it seems the description should include the important psychological factors. To characterize homes and schools as of a certain socio-economic rating is good; to classify them in terms of teacher and parental practices and attitudes would seem better.

In other words, at present we appear to be in a stage where changes in IQ appear in some environments and not in others. We have not reached the stage at which we can point to the potent factors in the environment so that another experimenter can take the descriptions and reproduce

the results But progress in this direction is being made. Stoddard (200), for example, reported a study by Dawe in which it was shown that training in the understanding of words and concepts over a period of ninety-two days resulted in an IQ gain of 42.9 points while a matched control group lost two points. It would appear that not until investigators at several different institutions have built known (that is carefully described), contrasting environments and have put children of known characteristics in these environments can the controversy be solved.

As a further caution to avoid overgeneralizing, results of environmental studies obtained in the present state of our knowledge of child development must not be extrapolated too far into the future. If an investigator finds at any given moment that he cannot change the course of development, he cannot logically conclude that no one will ever be able to do so.

Partially as a result of such studies and controversies there has appeared an urgent need for the improvement of mental tests. As Stoddard (204) says: "At present, controversies are on matters of degree. When viewed in the light of test inadequacies they are inconsequential. With everybody using blunderbusses the game is difficult to bag."

Methodological and Technical Problems

The problems encountered in obtaining cumulative data on adolescents studied at the Institute of Child Welfare of the University of California included the following, among others:

- sampling problems arising from restriction of the study to persons who will be available over a long term, the problem of maintaining comparable techniques of measurement, cooperation problems, in controlling motivation throughout a series of repeated measurements, the problem of the effect of the investigation upon the subjects of the study; statistical problems in (a) the choice and testing of methods for the transformation of scores, (b) the determination of trait clusters or composites, (c) the restriction or consolidation of variables for correlational study, (d) the selection of relatively homogeneous groups of subjects for special analyses, (e) the development of methods for describing individual growth curves, (f) the profile study of individuals (103).

Certain problems of testing are discussed later. We may note here that it has been stated that the use of the intelligence quotient in the interpretation of the nature of mental growth entails much confusion. The rate of change of mental level has been suggested as a more desirable basic concept for such an interpretation. The increased emphasis and understanding of development in terms of changes in behavior impose upon students of child development the necessity for making frequent observations of such changes. It is this that has given rise to the increasing number of longitudinal studies. Concerning this, McGraw has stated:

Any truly longitudinal study must be conducted in such a way as to indicate the nature of the changes taking place in the observed phenomenon. It would seem, therefore, that a longitudinal study would be comprised of any series of observations on a changing phenomenon, taken successively from the moment of inception until the changing characteristic attains stability or decline (167)

Technical Problems of Testing

Technical problems of intelligence testing have been treated in a recent issue of the *REVIEW* (211). A critical review has also been published by Braatoy (20). From a study by Wellman (238) it appeared that the Merrill-Palmer test measures a somewhat different set of activities from those of the Kuhlmann-Binet. A study by Honzik (90) dealt with the correlation between test scores at various early age levels and scores at the age of seven on the Stanford-Binet. Jenkins (99) compared the relative efficacy of IQ with the sigma value of the test score for the subject's age group. He suggested that the latter could be substituted for the former. Comparisons between original and revised Stanford-Binet tests were reported by Reymert and Meister (175), Black (17), and Ebert (54). The meaning of intelligence was discussed at length by Freeman (59). Lewin (118) discussed the relation of intelligence and motivation.

Observations Supplementing Tests

Hildreth (83) compared observational and test records of gifted and average children. The former elicited more favorable comments from the examiner, and only one-fifth as many unfavorable comments. Brody (23) noted that demented patients exhibit such forms of behavior on the Stanford-Binet vocabulary test in a revised form as excuses and escape behavior, excessively slow responses, incomplete comprehension, guessing, mispronunciation, lack of auto-criticism, as well as lack of insight, and a rather concrete approach.

There is increasing recognition of the need for considering growth in terms of materials and units other than those presented from intelligence test results. However, one of the difficulties encountered in many studies dealing with such materials is that the results do not yield readily to quantification and neat systematization. This difficulty was noted by McGraw (136): "Certain types of data may be recorded longitudinally at sufficient intervals to include all significant changes in the developing characteristics, and yet the data will remain utterly useless for symbolic or intellectual manipulation" (p. 88).

Sex Differences in Intelligence

Nelson and Richards (154, 155), in a study of forty-one girls and thirty-nine boys tested with the Gesell items within five days of their twelvemonth birthdays, found that girls were slightly superior to boys in standing alone, walking with help, walking alone, saying four words, building a tower of two cubes, using a third cube, and placing the rod in the hole of the performance box. Boys excelled in scribbling spontaneously and dangling a ring. As part of the California Growth Study, Stolz, Jones, and Chaffey (206) reported observations on the developmental patterns of boys and girls. No one general pattern was typical for this age group, although girls revealed an accelerated development as compared with

that of boys. The study by Symonds (212) revealed significant differences in interests in the different areas of life, although little light is shown on the nature of sex differences in mental ability.

Kuznets and McNemar (110) have presented a critical review of the literature bearing on this problem. Their conclusions support the viewpoint of a general absence of sex differences. However, other studies have suggested the possibility of the presence of such differences in certain types of performances. In the majority of the studies, girls are superior in language performances and school achievement in the academic subjects, with the boys showing a greater variability. Other studies bear on these problems, including one by Rundquist (180), which shows that there is a pronounced change in the significance of school marks of boys and girls as they progress from the elementary school to the junior high school. There is a continued significant relation between school marks and intelligence among girls, with a decreased correlation in the case of boys.

Family Factors and Intelligence

Roberts (179) reported a correlation of $-.22$ for number of siblings and intelligence of children. The mothers of the dullest children commence childbearing earlier and continue it to a later age than do other mothers. As much infertility was reported among the gifted poor as among the gifted families in higher economic categories. Penrose (164) and Cattell (33) have reported similar results. O'Hanlon (160) obtained a correlation of $-.21$ between the IQ of the child and the total number of births in the family. This was based on a study of 293 children from five to eight years of age. The correlation was raised to $-.41$ in the case of twenty-eight where the families, because of the age of the mother, were regarded as complete. Bradford (21) found similar results in a sample of British population. Cattell (33) attempted to deduce consequences that may follow from falling IQ's resulting from the difference in fertility among intellectual levels. These consequences are merely deductions and depend upon the conception of the nature of the intelligence used in the analysis.

From a study of a group of 1926 high-school graduates, Willoughby and Coogan (248) concluded that the true relation between intelligence and fertility is zero or slightly positive and that the usual notion of a negative relation results from a faulty inference from the intelligence-sibling number correlation to the intelligence-offspring number correlation. Willoughby (247) also reported a study of 108 members of a college class divided at the median intelligence test scores. No difference between high and low scoring groups in living births was found. In the interpretation of these results it should be borne in mind that either high-school or college groups are select. Complete data would include lower educational ranges.

Punke (171) reported data showing that children of older parents tend to be more intelligent than those of younger parents, but the finding may be accounted for by several factors. Conrad and Jones (40) concluded from their extensive study of familial resemblances of 997 cases in 269 family groups that the average of the mother-child correlations was essentially the same as that of the father-child correlations, the correlations for both being .49. The correlation between like-sexed siblings was no higher than that for opposite-sexed siblings.

Witty—in a study utilizing case history data, mental test scores, educational records, materials present on interest and personality inventories, and teacher's ratings—did not find any significant differences between "only" and "intermediate" junior and senior high-school pupils (252).

Bilingual children—Bilingualism does not seem to influence favorably or unfavorably the mental development of children under the conditions prevailing in four investigations examined by the reviewer, including Arsenian (9). The problem is complicated by the verbal-nonverbal test relation

Season of birth—Varying results have been found in studies of intelligence and month of birth (73, 81, 124, 167, 168). Where statistical differences have been found it has been noted that these may be influenced by ethnic or socio-economic or other complicating factors.

Socio-Economic and Occupational Status

A number of investigations, not here reviewed in detail, have confirmed findings previously reported that there are significant differences in intelligence among socio-economic and occupational levels. A critical summary has been published by Neff (152). Honzik (89) reported that the relationship between socio-economic status of parents and intelligence of children tends to increase as one goes from the three-year level to the eight-year level, which was the limit of the study. Leovinger (125) found no significant relationship between intelligence and socio-economic measures until about eighteen months, when the difference tended to become significant.

Race

Hu (92) reported that Anglo-Chinese did better than the English except for the eight to ten age group. However, he found larger differences between the two cities studied, London and Liverpool, than between the racial groups. The mental ability of the American Negro was studied by Jenkins (98) who found the differences within the two groups (Negro and white) greater than the difference between the groups. He also presented a critical review and concluded that the hypothesis of racial difference in intelligence has not been demonstrated. Hollingworth and Witty (87) discussed the difficulties involved in comparing races and listed topics for studies.

Intelligence and School Achievement

Grant (78), in an analysis of the number knowledge of 563 first-grade pupils, found a significant correlation between intelligence and the ability to count and to classify and interpret numbers, and to carry out the fundamental operations and the knowledge of geometrical forms. Conklin (39) in an interesting study compared a group of 32 boys and 33 girls with intelligence quotients of 130 or over in Grades II through VII who were failing two or more subjects with a control group having similar intelligence quotients. Case studies tended to reveal that the failing group scoring lower on a studiousness index had mothers of less favorable personalities and were rated by psychiatrists as "poor risks." Similarities between the experimental and control groups exceeded the differences.

Leavell and Sterling (115), in a study of reading patterns of sixth-grade children, found a fairly marked tendency for the less intelligent children to make more regressions, more fixations, lower rate and comprehension scores, and to have a narrower span of recognition than the more intelligent. Billhartz and Hutson (16) found a positive relation between intelligence test scores and success in academic subjects, although the relation with industrial arts honor points was negligible. Discrepancies existing between school grades and intelligence did not show any relation with extracurriculum activities in the study conducted by Remmlein (172) of the records of seven hundred high-school seniors. Nemzek (156) found that when intelligence was held constant the relation between such non-intellectual factors as the education of the mother, occupational status of the father, and age of entrance to the elementary school became almost negligible.

Traxler (227) found the language and nonlanguage factors of the California Tests of Mental Maturity to be only slightly related in a group of twenty-one eighth-grade and seventy-three ninth-grade pupils. The differences between language and nonlanguage IQ's were found to be much greater for superior than for inferior children. This is to be expected on the basis of the positive relationship found between intelligence test scores obtained from language tests and reading test scores. This is also in harmony with the findings from the study by Edwards and Jones (55) of the intelligence quotients of children from the north Georgia mountains. The trend of the differential between intelligence and achievement in low and high intelligence groups was studied by Odom (159).

Intelligence as Related to Emotional and Social Adjustment

A small but significant correlation between intelligence and adjustment is reported by investigators. Lichtenstein and Brown (121), in a study of all the children in Grades IV through VIII from four public schools adjacent to the business and industrial districts of Chicago, found the children in this delinquency area to show mental retardation and a down-

ward trend in the mean IQ's of the successive age groups. What is cause and what is effect is not clear. Griffiths and others (79) reported intelligence as a favorable factor in school adjustment. Krugman (109), in a study of more than 12,000 children given Binet tests, found the clinic children to show a higher proportion of dull, while the control or selected group showed a similar trend for the bright. Wile and Davis (246), in a study of 250 children with mental ages of ten years, found a slight relation between mental age and behavior problems. Lurie and others (130) reported a tendency for children with low IQ's to compensate for their retardation by development of social maturity beyond their intellectual level. Lorge (129) concluded that whenever paper and pencil tests are used to measure performance related to personality some significant correlation with intelligence may be expected. Mann and Mann (141) presented a recent summary of some of the best studies relating to the problem of intelligence and juvenile delinquency. This was enlarged upon by Garrison (61) the following year (1940). Studies in this area will not be covered in this review.

Mentally Retarded Children

Valentiner (229) reported that subnormals score lower than normals in hand grip and steadiness of movement tests, but they are not necessarily more fatigable. He found subnormals less accurate and showing a more rapid decline in rate and accuracy than normals in such tasks as color naming and cancellation. Spoerl (196) found feeble-minded children superior to normals of the same mental age in drawing.

Doll (49) suggested "colonies" or "hostels," such as found in other parts of the world, to fill the gap between institutions and home care. The former can care for only a small percent of the total number of feeble-minded cases. Kinder and Abel (107) prefer a "metropolitan community" setting for subnormals to the institutional. Better social adjustment seemed to result in the former. Rural ungraded schools are similarly believed superior to graded schools for both social and educational adjustment (Layman, 114). Pritchard, Horan, and Hollingworth (170) found no change in mental status of dull normal children after two years in a specially planned educational program. One hundred and eleven cases were followed. Melcher (146), in contrast, found gains in IQ for subnormal children who had a prolonged "preacademic" training in preparation for regular school work.

Gifted Children

Thorndike (222) defined "gifted" as representing the ability to work with ideas. Faris (56) pointed out a sociological factor in the making of the genius. The gifted are consistently higher in educational achievement, especially reading (83, 84). Thorndike (223) reported that gifted subjects

reveal fewer fears and worries, but less maturity in judgment of wrongs, and in interests (on Piessey interest-attitude test). Gifted children have more interests than the retarded and more of them have hobbies according to the results of Lewis and McGehee (119). Nevill (153) found that the gifted excel in expression, alertness, and similar traits.

Several follow-up studies of Terman's genius group have appeared during the period under review (217, 218). Terman and Oden in the 1936 follow-up study found that nearly 90 percent of the boys and 80 percent of the girls entered college. Of the boys entering, approximately nineteen out of twenty graduate, of the girls, nine out of ten. At least half of the boys were launched on promising careers. From a comparison of a group of 167 most successful individuals with 146 least successful individuals the authors concluded that above the IQ level of 140 adult success depends largely upon such factors as emotional stability and drive to accomplish. Special education programs for the gifted were described by Martin (143) and Alpern (4). Programs include special schools, special classes, contract method, and various forms of enrichment. The increasing of IQ's of children already superior has been attempted by McCandless (131), who carried young children through a year of enriched training.

Early Learning

At least two investigators (105, 142) have shown that feeding is related to behavior in the elementary school. Preliminary work by Crudden (42) indicated chronological age is related to abstraction ability, especially when varying degrees of difficulty are involved. Later work with 65 children ranging in age from sixty-five to seventy-eight months revealed that children having higher IQ's tended to be better abstracters and that girls were superior to boys. Lacey and Dallenbach (111) studied the acquisition of the understanding of cause-effect relationship in 160 children varying in age from five to nine years. They reported that children in school learn the cause-effect relationship by the end of the eighth year or by the beginning of the ninth without special instruction. With special instruction, however, the relationship can be learned by children at about seven years.

Welch and Long (235), in a further investigation of concept formation, trained fifty-four children to associate different species and class concept names with a cube and a cylinder. They found that concepts may develop in a vertical or horizontal direction and that it was more difficult for the children to learn the concept of a second hierarchy in the vertical direction than it was to learn the concepts of three different first hierarchies in the horizontal direction. Long (126) studied the concept of roundness in thirteen children ranging in age from three years to six years and three months and found that all his subjects gave evidence of having established the concept. Twenty action-agent concepts of college students were compared with those of kindergarten and first-grade children by Wilson (249).

Form Discrimination and Spatial Relationships

There is fairly general agreement that form discrimination by very young children is only slightly influenced by relative position, spatial orientation, or size. In a well-planned experiment with children from six to fifteen months of age, Ling (122) found simple geometric form discrimination present as early as six months of age. She also discovered this discrimination behavior could serve as a learning cue. Marked individual differences in form discrimination were reported. Leuba (117) studied the reactions of twenty-one nursery-school children aged from one and one-half to five and one-half years to elements of single geometric patterns. Long (127) studied size discrimination in young children varying from four to seven years in age. The comprehension of spatial relations in sixty-three preschool children ranging in age from eighteen months to five and one-half years was studied by Meyer (147). Three developmental stages were found.

According to the study by Werner (243), the perception of spatial relations improves with increasing mental age. The conclusions by Leyer (120) suggest that depth perception during childhood depends largely on conceptual factors, whereas certain peripheral components affect this at a later stage. Spatial orientation of boys and girls, Grades V to VIII, from rural schools of southern Michigan, was studied by Lord (128). Orientation for distant places followed somewhat that of the conventional maps and textbooks, while that for nearby places related closely to certain personal experiences. R. Cattell (32) has published a so-called culture-free test for measuring intelligence, consisting of seven subtests, perceptual in nature. Cattell has emphasized the value of perceptual tests for measuring the higher mental processes.

Language Development and Intelligence

A graphic method for the simultaneous presentation of a number of central tendencies in speech sound data was developed by Irwin (94), who studied and compared the vocalizations of newborn infants and of older groups. A study of the vowel elements in the crying vocalization of forty infants under ten days of age by Irwin and Curry (95) showed that only one vowel was common to all infants and only four occurred with appreciable frequency. The common content of speech in preschool children was studied by Shirley (183). The well-known positive relationship between language development and socio-economic status was verified by Young (257) in a matched group study of the language behavior of seventy-four children aged thirty to sixty-five months. Gaskill (62) reviewed the literature on the relationship between intelligence and language facility and reached the conclusion that no clear-cut relationship existed.

The study by Irwin and Newland (93), with 306 subjects aged four to eighteen years, was concerned with the genetic development of certain characteristic ways of naming visual figures. A study by Bennett and

Roslow (14) provided a basis for evaluating language growth through a study of norms for the Columbia Vocabulary Test extended from Grades IX through XII. Quoting opinions from 1750 to the present, Parker (162) pointed out the close relation between language expression and clarity of thought. According to the study by Millard (149), the growth of reading ability among preadolescent boys and girls approximates a curvilinear development from grade to grade.

The Ellis Visual Designs Test has been found useful for designating the extremes of visual memory and reproduction (255). A significant finding in this connection is the low correlations obtained by MacMurray (137) between the performance in verbal and nonverbal intelligence tests for bright and dull children. The correlation obtained between the IQ's secured from the tests given to the dull group was .43, while that obtained for the bright group was .23. Such correlations supported by evidence from Thurstone's tests for primary mental abilities (226) would indicate that IQ's obtained from verbal and nonverbal tests cannot be used interchangeably. Stalnaker's (197, 198) analysis of the results of tests given to freshmen and other studies such as those of Brody (22, 23) gave Traxler (227) and Edwards (55) still further support to this contention.

Memory

Dudycha and Dudycha (52) reviewed thirty-five articles and books dealing with childhood memories. They discuss the values of various methods of study. There seems to be "fair agreement that the earliest remembered experience for most people dates back to their third or fourth year." (p. 673). There is agreement also that women tend to recall earlier memories than men, the differential being some two months. Visual memories predominate and it is also suggested that a fairly high negative correlation may exist between intelligence and earliest memory. The criticism that most early memories are verbal stereotypes or memories of being told of early experiences is not dealt with effectively.

To plot the growth of memory functions throughout adolescence and youth, studies are needed to answer questions such as: Are there differences in the relative effectiveness of various presentations at various age levels? Do the effects of a given kind of material change with age? Are there differences in the phenomenon of forgetting? On the whole, experiments have not been set up to answer such comparative questions. A study by Burt (28) compared the effect of memorizing meaningless material during infancy upon relearning at later age levels. Meaningless material was read aloud frequently to a subject fifteen months of age. At eight and one-half years the learning of some of the original material was compared with the learning of comparable new material. This process was reported at fourteen years of age. At eight and one-half the relearning required approximately 30 percent fewer repetitions for the old material than for the new. At age fourteen, however, the corresponding figure had dropped to 8 percent. In numerous

studies of the effect of various methods and conditions on the memory functions, the investigators considered but one age level, hence the data do not directly contribute to development.

The phenomenon of reminiscence was positively reported by Ward (231) and by Hovland (91). However, Bunch (26) suggested certain experimental difficulties that may account in part for the apparent appearance of the phenomenon. The effect of feeling tone or affective tone on memorizing was studied by Gilbert (70, 71) and Lanier (113). Lanier found no clear-cut evidence that pleasant memories tend to persevere, while Gilbert found the tendency to remember pleasant association more evident in adults than children. Gilbert (70, 71) also reviewed experiments published since 1929 and concluded that the weight of evidence is in favor of the hypothesis of affective selectivity in memory. Courts (41), in an interesting study, reported that induced muscular tension tends to facilitate memorizing of nonsense syllables until an optimum is reached. The conditions of human forgetting were summarized by McGeoch (134, 135).

Development of Thinking, Reasoning, and Problem-Solving Behavior

An excellent review of the literature dealing with the development of thought in young children was published by Johnson (102). She pointed out that studies of problem solving have shown that the stages of solution involved are similar for children and adults and that marked overlapping of behavior occurs from six to twenty-three years of age. The thought processes of the child and the nonscientific adult are reported to be similar. Studies of children give evidence of the early development of concepts and the ability to respond to relative similarities and differences. She concluded by stressing the fact that experiences which give opportunity for, and motivate toward, the development of thought should be provided at an early age. Gibson and McGarvey (69) reviewed 108 experimental studies of thought and reasoning. Certain theoretical aspects of problem solving were discussed by Maier (140). The responses of 77 preschool children ranging in age from two years and three months to four years and eleven months to a series of fifteen pictures were investigated by Amen (5). She found developmental trends in simple enumeration (decrease), overt activity (increase), and psychological states or inner activity (increase). She also found a developmental change from literal, concrete interpretation of details to more subjective interpretation; developmental changes in motivation and interest; and a sequence of development from interpretation of a part as the whole, through four steps to the stage of complete analysis of the complete whole.

The possible effects of using subjects of different backgrounds of education and experience are not generally recognized, and conclusions from studies must, therefore, be tentative. Johnson (102), in a comparative study of children and adults in an unfamiliar situation, found considerable simi-

larity at the two age levels. In unfamiliar situations the adult often reverts to habitual forms of response which are repeated though previously found unsatisfactory. Abel and Sill (2) in comparing the thinking of normal and subnormal adolescents found that the normal adolescents' reactions were less concrete and were not characterized by the mode of instruction which was evidenced by the subnormals. Pickford (166) concluded that insight seems to develop by steps, some of which are not conscious. Differences in the suddenness of insight were found. The pre-insight period seemed to be occupied not by random trials and error but by directed thinking. Duncker and Krechevsky (53) suggested a general relationship between learning and thinking, and reported some striking similarities between thinking in human subjects and discrimination learning in rats. Christof (38), in a study of the thinking process, identified three stages—the formation of the problem, the elaboration, and solution or defeat. Patrick (163), in two studies of creative writing and creative drawing, found approximately the same stages in both: (a) preparation, the assembling of ideas, (b) incubation, repetition, modification, and selection from the associations; (c) illumination, the crystallization of the final ideas; and (d) verification and revision of the ideas selected. It would seem that the "stages" of thinking would depend upon the training and intelligence of the subjects.

In studies of the development of effective thinking, Wrightstone and others (256), Jersild, Thorndike, and others (100, 101), and Sells and others (182) gave comparisons between the performance of pupils in schools where newer teaching practices have been introduced and the performance of pupils in more traditional schools. They used the Modern School Achievement tests and a specially constructed test of "intellectual and dynamic factors in the social studies." Ulmer (228) has studied the development of thinking in connection with the teaching of geometry at the high-school level. Training in thinking has been the subject of a number of books and programs. These include a series of books by Center and Persons (35, 36, 37), Wood (254), Holmes (88), Thouless (225), Graham (77).

Boreas (23) in several studies, some of which involved the completion of pictures and stories and the interpretation of ink blots, reported that, in general, imagination as measured by the tests increased gradually to a peak at about age eighteen, declining thereafter. No appreciable sex differences appeared. Correlations between memory and creative imagination equalled .50 to .60, the coefficients increasing with age. Correlations slightly below .70 with intelligence were obtained, the coefficients increasing with age. Meier (145) found art students in general superior to other subjects in constructive imagination. Tests for imagination are suggested by Higginson (82) and Meier (145).

The most useful pictures for studying the phantasy of adolescents were described by Symonds (213): ". . . have a minimum of detail, are vague in theme, incomplete in content, and suggest characters with which those telling the stories can identify themselves" (p. 272). Bender and Vogel (13)

surveyed the literature dealing with imaginary companions and presented their own results of a study of fourteen cases involving imaginary companions. They concluded that the child uses imaginary companions to supplement deficient environmental experiences and emotional inadequacies and that the phantasied companions can be made to disappear by appropriate therapy. After comparing the thinking behavior of three schizophrenic children aged from seven to fourteen with fifteen normal children aged from two to five, Despert (47) concluded that true hallucinatory or delusional fantasies are not found in normal children.

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CHAPTER III

Mental Development and Performance as Related to Physical and Physiological Factors¹

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THE PRESENT REPORT deals primarily with studies appearing since the publication of two summaries by Jones (66) and Shock (120) in 1939. The topics covered include mental development as related to (a) structural characteristics represented in measurements of height or other body dimensions, or in assessments of skeletal maturity; (b) physical or sensory handicaps, (c) factors associated with premature birth, birth month, age of mother, birth order, etc., (d) physiological factors such as are involved in nutrition, endocrine functions, drug effects, etc.; and (e) disease conditions, such as encephalitis, poliomyelitis, allergies, tuberculosis.

Mental Development and Structural Characteristics

Height and weight—As previously noted (66), it is usually found that a low positive correlation, rarely higher than .30, exists between the intelligence of children and their physical development as expressed in height or weight. In line with this, Middleton and Moffett (86) reported a correlation of .22 between intelligence and height and .15 between intelligence and weight in a group of 490 college freshmen. No significant relationship was found between physical measurements and scores on the Bernreuter test (85). Somewhat surprising are the results obtained by Katz (67) for 112 boys and 117 girls who received Stanford-Binet tests semiannually between the ages of three and five years. Contrary to the usual experience, no significant correlations were obtained for the boys between median IQ and height or weight. For the girls, on the other hand, exceptionally high correlations were obtained: IQ with height, .40, with weight, .34. It is probable that these findings are the result of special conditions in the selection of samples. An "unexpectedly high relation between intelligence quotient and stature" has been announced by Boas in a recent study (18), but his report gave neither the magnitude of the correlation nor other data necessary to appraise the conclusions reached.

Weight at birth—Particularly in connection with studies of premature children the question has been raised as to whether weight at birth would show a relationship to subsequent intelligence. No relation has been found in American studies by Hess, Mohr, and Bartelme (62) or by Benton (11). Brandert (24), however, in an investigation of Finnish

¹ Bibliography for this chapter begins on page 546.

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children, reported a positive and linear correlation. Benton (10) re-analyzed Brander's observations and demonstrated a curvilinear relationship ($r = .23$; $\eta^2 = .35$). It is possible that varying conditions associated with nutrition and with differential mortality may be responsible for these variations in results, when children from different cultural or national groups are compared.

Dwarfism—It has sometimes been claimed that individuals markedly retarded in physical growth tend to be retarded in mental development. The evidence for this probably rests upon observations of cretins, who commonly show a reduction in intelligence if the hypothyroidism is so severe as to result in dwarfism. On the other hand, dwarfism from other causes, such as pituitary dysfunction, may involve no necessary alterations in mental development (50).

Skeletal maturity—Measures of body dimensions at a given age may be influenced not merely by the various hereditary and environmental factors which determine size but also by individual differences in physiological maturity. A more direct index of maturity is provided through assessments of skeletal ossification, based on X-rays. Earlier studies in this field, employing children, have been extended by Flory (43) to the college level. Since ossification of the carpal bones is practically complete by the age of seventeen years, the criterion of skeletal maturity used in his investigation of ninety-five college freshmen was the degree of closure of the radial and ulnar epiphyses of the right hand. Flory reached the conclusion that academic achievement in the freshman year is influenced by maturity factors; the skeletally less mature students tended to earn lower grade point averages even though they were slightly superior in intelligence scores. None of the relationships found, however, was statistically significant.

Capillary structure—The microscopic structure of the fingernail capillaries has received considerable attention in the German literature. The original contention of Jaensch (64) that mental retardation is closely related to capillary changes has not been borne out by subsequent investigations (see review by Suckow, 128). Several reports (70, 71, 72), however, have shown that in severe cretinism characteristic changes occur in the nail capillaries, these may respond to thyroid therapy, even though the mentality does not improve. Witneben (136) believes that the capillary picture is useful in distinguishing between feeble-minded adolescents who will respond to organic therapy and those who will not, he recommends sterilization for the latter group. Except in the case of cretinism, competent investigators in this country have failed to find any clear-cut relations between capillary characteristics and mental defect (70).

Physical Defects and Scholarship

While a relationship between mental retardation and physical defect is well established, most of the studies reported in this field have not been

able to furnish clear evidence of the nature of the relationship. For example, it is commonly reported that cases with physical defects tend to be weighted with lower scholarship. A recent study by Woofter (137) of primary-school children confirms this finding, in demonstrating poorer average grades for children with infected tonsils or with various other types of physical or sensory defects. One cannot conclude, however, that the defects are responsible for the scholarship impairment, since to unknown degrees the relationship may be influenced by common hereditary factors, expressed both in mental and physical development, by factors associated with socio-economic status, and by various modes of interaction of these. It seems probable that some effect is exerted by physical defects through irregularities in school attendance, since children with infected tonsils, for example, were found to have a much larger number of absences than those with normal tonsils. Lee and Nemzek (73) have attempted to meet some of the criticisms of earlier studies by comparing school achievement of three hundred children suffering varying degrees of physical defect with achievement in a control group equivalent with respect to mental rating, grade location, curriculum, age, sex, and occupation and nationality of parents. A matched pair technic was used. Significantly better marks in mathematics, English, social science, general science, and health were obtained by the girls without physical defects than by those with defects. No differences were found in the case of boys. Unfortunately, the kind or seriousness of the defects was not stated. The sex difference in the relation of physical factors to achievement may possibly reflect a tendency for girls to work nearer their maximum capacity. This would result in the common finding of a superior scholarship for girls as compared with boys when working under normal conditions. It might also result in a greater susceptibility of girls to the effects of physical handicap, since they would have less "reserve" capacity to use in compensation.

Sensory Defects and Intelligence

Among studies concerned more specifically with sensory handicaps, Dispensa (44) used the Snellen Project-O-Chart to test 4,314 subjects in elementary, junior, and senior high schools of Santa Barbara, California. She found no significant differences between the visually handicapped (vision 20/40 or 20/100) and the normal groups with respect to average intelligence, reading ability, and grade placement. The hypothesis that sensory defects offer indication of generally "inferior stock" receives no support from measurements of intellectual capacities of blind or deaf children. Hayes (57) has demonstrated that because of good habits of attention to auditory stimuli, blind children actually excel normal children in certain memory functions such as memory for digits backward and memory for disconnected words. On the other hand, there was no evidence for general compensatory superiority in memory among the blind, and the conclusion was reached that compensation in the blind is the reward of effort rather than a "special gift."

Deaf and hard-of-hearing children—Comparisons of deaf with normal children have not always been in agreement. As in other cases of physical defect, if a survey reveals an apparent mental retardation among deaf children several questions must be answered before an interpretation can be reached. Has the investigator succeeded in obtaining a representative sample rather than merely an institutional group which should not be compared with norms for a general population? Has he employed tests which are independent of auditory cues or auditory experience? Has he eliminated individual cases of pathology in which the sensory defect and the mental retardation are both due to some common factor such as birth injury or infection?

In a study of performance on the Porteus maze, Zeckel and Kolk (140) matched 100 congenitally deaf children with 100 normals, on the basis of age and socio-economic status. At each age level from seven to fourteen years the deaf children were inferior, leading to the conclusion that "deafness creates a mental backwardness which impedes also the development of regions of the intellect other than those developed by speech." Goodlett and Greene (53) have reported lowered scores on five nonlanguage tests administered to colored deaf and blind children in a West Virginia institution. Since the scores obtained were compared with norms from non-institutionalized white children, it seems probable that the differences are not wholly due to the factor of sensory defect. Studies by Springer (126) with the Goodenough drawing test and by Pintner and Lev (101) with nonlanguage intelligence tests have failed to indicate inferiority in deaf children; in the latter investigation, however, hard-of-hearing children obtained slightly lower scores on verbal intelligence tests. This was attributed by the authors to social rather than to intellectual factors. An extensive summary of psychological experiments with the deaf has recently been made by Cutler (40).

In the classroom situation, progress may be impaired by inadequate hearing. For instance, Caplin (32) has found that 42 percent of the hard-of-hearing children in the elementary schools of New York City were retarded one grade or more. After receiving six months to two years of instruction in lip reading, only 5.8 percent of a group of 4,566 children showed retardation of one grade or more. In spite of the lack of quantitative assessment of the degree of hearing impairment, this study offers a strong argument for the intellectual normality of the hard-of-hearing children. Bridgman (25) has reported on eighty-three children who were sent to a clinic because of scholarship difficulties or other failures in school adjustment. While mental retardation was apparently a factor in some cases, the author emphasizes the necessity of taking into account other factors, such as unfavorable combinations of cultural-economic conditions, or brain injury or disease causing disturbances other than deafness. The importance of this latter factor has been emphasized by Winnemisser (135) who found that where mental retardation occurs in conjunction with deafness this is often attributable directly or indirectly to birth injuries.

Premature Birth and Mental Development

The weight of accumulated evidence indicates that premature birth, with its denial of the later stages of intra-uterine existence, has on the average no handicapping effects upon later mental development. It is true that Schoberlein (112) reported mental retardation in six cases out of a total of ninety-six premature infants who were studied at ages ranging from six to eighteen years. However, the range in IQ was within the normal zone, and it is clear that the diagnosis of mental retardation was based more on school progress and reports from teachers than on the actual objective measurements of intelligence. Investigators who find a greater incidence of mental defect among prematures should scrutinize their data with reference to the adequacy of the sample, for it is sometimes easier to assemble cases from an inferior socio-economic selection, as from a clinic or a public institution, than to obtain a group representative of the general population. Moreover, if the sample of prematures is weighted with cases that have suffered from minor birth injuries, it will be difficult to distinguish between the effects of prematurity per se and the effects of cerebral injury; wherever possible, cases with known pathology should be excluded or considered separately. Various investigators (8, 11, 55) have reported normal intellectual development in prematures beyond the age of three years. In a critical review of the literature, Benton (10) concluded that "most of the reliable studies indicate that as a group prematurely born children are not inferior to full-term children in respect to intellectual development."

Premature children have been said to show an increased weighting of various types of behavior disturbances (23). Brander, however, was unable to prove a relationship between birth weight and the incidence of such traits, since a high incidence of familial mental disorder was observed in the sample, there is little basis for the assumption that premature birth rather than other causative factors led to the disturbances later noted.

Shirley (118) has described what she called "a behavior syndrome characterizing prematurely born children." This syndrome includes an array of characters ranging from "auditory and visual keenness" to "brief attentivity, distractibility, irascibility, stubbornness . . . shyness and dependence on the mother . . . perhaps high and versatile esthetic interests." The subjective character of such traits and the absence of procedures for their quantitative evaluation makes it difficult to assess the usefulness of the concept of a "prematurity syndrome."

Season of Birth and Intelligence

Since the earlier studies by Huntington and by Pintner and his associates (reviewed in 66), reports have continued to appear on the relationship between intelligence and month of birth. Pintner and Forlano (100) have assembled data for approximately 3,000 cases in the southern hemisphere

(chiefly Australia); while little is known about the sample, it appears to be a randomly selected school population. Although no reliable differences were found, the obtained IQ's were slightly lower for children born in winter than in other seasons, agreeing with comparable records from the northern hemisphere. In a careful sampling of Scottish children, Rusk (110) showed a slight tendency for those born in February to have lower IQ's than those born in August; again, the differences are not statistically reliable. The surprisingly consistent findings in this field have been explained by Goodenough (52) in terms of (a) the known relation between socio-economic status and intelligence, and (b) a seasonal differential in frequency of births among children of different socio-economic groups. This explanation is supported by the fact that when children were classified according to paternal occupation those in lower occupational groups were found to have a fairly uniform frequency of births in the various seasons, while those in higher occupational groups showed a higher frequency of births in those months already recorded as being weighted for higher average IQ's. Goodenough's interpretation would seem to be in accordance with the fact that in samples which are relatively homogeneous with regard to social status, birth month variations apparently do not occur in IQ, this is illustrated in the negative findings for college students by Held (60), Forlano and Ehrlich (49), and Clark (36), as well as by the negative findings in studies of the feeble-minded (91).

Birth Order; Maternal Age

Previous reviews have indicated that where other factors are adequately controlled, IQ is unrelated to birth rank in normal populations. Subsequent studies have corroborated this conclusion (43, 104). This statement is not contradicted by the reports of increased incidence of birth injuries in first-born children (97) or the higher incidence of Mongolism in later born children (98). Recent studies tend to confirm the earlier belief that advanced maternal age is an important factor in the incidence of Mongolism. According to Penrose, "the probability that a mother will have a Mongol child is more than doubled for every increase of five years after 25 years of age." Dayton and Truden (43) studied 23,422 families of public-school children and, after making due allowance for family size, concluded that maternal "exhaustion" (as indicated by advanced age at the birth of the child) contributes to the production of imbecile as well as Mongol children. Although mental aberrations associated with birth injuries tend to be more frequent in first-borns, Malzberg (82) could find no evidence that the incidence of dementia praecox or manic depressive insanity in later life was related to birth order.

Anoxia; Asphyxia at Birth

Although birth injuries resulting in cranial hemorrhage are known etiological factors in motor and mental impairment, asphyxia prior to or

during birth has only recently been recognized as a possible factor. Yant and others (138) and Courville (38) have shown that repeated anoxia of the central nervous system may result in mental deterioration even in adults. Schreiber (114) examined paranatal records of 252 mentally defective infants and children for whom there was no history of inherited defect, infection, or trauma unassociated with birth. Seventy-six percent of these cases were found to have a history of asphyxia at birth. Since many of the drugs and anaesthetic agents used to produce analgesia and amnesia in the mother at birth depress respiration in the fetus, it is clear that controlled studies are needed with regard to the effects of anoxia upon subsequent mental development.

Dietary and Nutritional Influences; Vitamins

Relationships between either qualitative or quantitative inadequacies in the diet and mental development are difficult to evaluate in humans because of the difficulties in controlling cultural and other factors which may be correlated both with diet and with mental development. Seymour and Whitaker (117) reported a clinical study of fifty underprivileged children six and one-half years of age. The children were divided into two groups of the same average intelligence. The experimental group was provided at school with breakfast of fruit juice, porridge made with milk, fish or eggs, brown bread and butter, and cocoa made with milk. The control group had their usual inadequate breakfast of bread and tea at home. The two groups were taught in the same class throughout the duration of the experimental period of eight weeks. During this time arithmetic and English grades showed 7 to 10 percent more gain in the experimental than in the control group. The output of the experimental group in standardized tests, such as cancellation, showed more improvement than in the case of the control. Differences in mental output were not apparent until the tenth day of the experiment, and the test scores of the experimental group diminished again within a week after the breakfast was discontinued. Although one is tempted to conclude that the improvement in mental performance was due specifically to the improvement in nutrition, procedures of this type always involve a complication of variables; it is difficult, for example, to know to what extent the experimental group may have been influenced in the direction of better rapport or stronger motivation, merely through the fact of membership in a group that was receiving special attention.

O'Hanlon (92) reported a correlation of .18 between nutritional state and IQ in a group of 293 children from slum areas. It is possible that such a relationship is not general but occurs only among economic marginal groups with gross dietary inadequacies. Bills (16) has reported increased mental fatigability among malnourished children (as measured by number and length of "blocks" in color naming)

Vitamins—Colby and others (37) have reported acceleration of development by the administration of additional amounts of vitamin B (prepared from a water extract of rice polishings) to 25 artificially fed infants five and a half weeks of age. At six months the experimental group showed superiority in 59 of the 64 items tested (such as visual pursuit, sustained fixation, eye-hand coordination patterns, and prehension) over a control group of similar socio-economic status. When the same children were retested at nine months of age the experimental group was superior in only 46 of the behavior items, and at twelve months the two groups were equivalent in performance. Although histological evidence is completely lacking even in animal experiments, the authors believe that the behavior differences may be accounted for by the stimulation of more rapid neural myelinization.

In an experiment covering four months, Lemmel (74) found that daily administration of 100 mg of ascorbic acid (vitamin C) to 110 institutionalized deaf mute children resulted in improvement in "general efficiency" of 48 percent of the group as reported by twelve different teachers, in contrast to improvement reported in only 11 percent of a control group. The teachers' reports indicated gains in attention and alertness rather than in actual performance. Since no standardized tests were applied and since the "control group" was on a diet somewhat deficient in vitamin C, it does not follow that increased vitamin C intake in all children will result in improved mental performance. Other studies with mental defectives (76) have failed to show improvement in mental condition following vitamin administration, although improvement was noted in appetite and other aspects of physical condition.

In animal experiments, more severe degrees of vitamin deficiency may be produced than is possible in human subjects, and more adequate controls can be maintained. Recent studies by Biel (15) have shown that severe starvation in rats resulted in impairment of learning ability, which, however, did not persist when the animals were tested at later ages (14). Studies which have shown deleterious effects of vitamin B deprivation on maze learning in rats (103) are open to some criticism because of the low motivational level, impaired appetite, generally poor physical condition, and poor motor coordination of the deficient animal. Wickens and Biel (132) have attempted to meet such criticisms by showing that vitamin B₁ deficient rats were significantly slower in acquiring a conditioned eyelid response than were normal animals. This study led to the conclusion that vitamin B₁ deficiency may have harmful effects on the developing nervous system itself. Whatever these effects may be, at least in the case of B₁, they apparently do not result in permanent damage, since animals cured of pellagra have shown normal learning ability in a maze problem (123). Recent studies by Patton (95) and Patton and Karn (96) reveal a high incidence of sound-induced convulsive seizures in rats maintained on a vitamin B₁ deficient diet. These results indicate the necessity for careful control of dietary conditions in animals used in such studies as those con-

ducted by Maier (81) on "experimental neurosis," so-called, or on "experimental epilepsy."

Effects of Thyroid on Mental Development

Improvement in mental capacities following thyroid therapy occurs in some but not all cretins (27, 111, 115). Brown, Bronstein, and Kraines (27) have made repeated observations on a group of twenty-nine cretins over a period of seven years. All the subjects with an IQ over 70 had begun treatment before the age of four years, some, however, who received treatment at an early age remained severely retarded. Even though complete mental normality cannot be restored to all cretins, with early and persistent thyroid treatment it seems that the social adjustments of such children are improved by glandular therapy. McDonald, Brown, and Bronstein (79) found among the previously mentioned group of cretins that patients between the ages of one to seven and seventeen to twenty-one years seemed to have made the best social and family adjustment. This is perhaps because the younger cretins are still considered babies by parents, while the older ones are accepted because they are able to take care of themselves and cause little trouble. Cretins between the ages of seven and twelve are reported as having the most difficulty in adjusting to other children. Thyroid therapy has been effective in improving social adjustments, since with even a modicum of physical improvement the patients are more readily accepted by other children and especially by their parents.

Sontag and Richards (124) reported that in young children "behavior changes, such as increased alertness, activity and aggressiveness occur before a marked change in skeletal development can be demonstrated when thyroid extract is fed." It is, however, generally believed that osseous retardation is more apt to respond to thyroid therapy than is mental retardation (133). Schreiber, Bronstein, and Brown (115) reported rapid development of language facility in certain cretins under thyroid therapy.

Crile (39) has recently expanded further on his general thesis that "variation in the size of the brain, the heart, the thyroid gland, and the adrenal-sympathetic system is the sole cause of the variation in the intelligence, power, and personality of wild and domestic animals." Crile argues that the relatively large brain of man requires a larger thyroid gland for the maintenance of constant oxidations, while smaller adrenal glands are required for the emergency release of energy. He sees in the increasing incidence of thyroid, heart, and vascular disorders evidence that evolution cannot continue further in the direction of a larger thinking brain and larger thyroid gland. This concept receives small support from experimental studies on the relationship between thyroid function and intelligence either in animals or in humans under normal conditions. Since the basal metabolic rate is commonly considered as an index of the functional level of activity of the thyroid gland, we should expect to find a significant correlation between intelligence and metabolic rate if the above hypothesis

is correct. Hinton (63) has reported correlations of the order of 80 between Binet IQ and basal metabolic rate in children at ages six, seven, eight, or nine years. At ten to eleven years the correlations drop to about 70, and at the twelve- to fifteen-year level the correlations are about 50. These results are in disagreement with similar measurements made on adolescents (122) or college students (45, 94). Other studies on institutionalized or clinic children aged six to twelve years have yielded extremely low or zero correlations (75, 109). On the basis of our own and similar studies the reviewers have concluded that slight variations in functional activity of the thyroid gland are not reflected in changes in mental capacity, for in most individuals other adaptive mechanisms are present which serve to compensate for this thyroid deficiency. However, as the thyroid deficiency becomes more and more acute, a point is reached beyond which compensation is not possible, with the result that mental retardation occurs as a symptom. Further experiments should be made on young children with carefully controlled metabolism determinations to see whether a significant relationship is present at a time when structural development is taking place in the nervous system.

Carefully controlled animal experiments have been also, for the most part, unsuccessful in demonstrating close relationships between thyroid and mental functions. Brody (26) reported no significant change in reaction time in adult rats fed thyroid hormone, even though the basal oxygen consumption was increased as much as 50 percent in individual animals. Partial thyroidectomy with slight diminution (5 to 26 percent) in basal oxygen consumption caused a slight (statistically insignificant) decrease in speed of reaction. Morrison and Cunningham (90) reported an impairment in establishing a conditioned response in cretinous rats; this was removed by administration of thyroid. Russian and Japanese investigators have had more apparent success in getting positive results as, for instance, in the finding that thyroidectomy makes conditioning impossible in rooks (131), or that feeding thyroid increased the speed of learning a delayed reaction in rats (as shown by Y. Nomura in the Sixth Congress of the Japanese Psychological Association, 1938).

Intelligence of Diabetics

Considerable attention has been given to the intelligence of diabetics. Since the last review was written (120), additional evidence has appeared to substantiate the conclusion that the distribution of intelligence is the same in children suffering from diabetes as in normal samples, if socio-economic factors are controlled (29, 80, 130). It should be emphasized that most of the physiological effects of diabetes (low blood sugar, coma) tend to result in impairment and damage to mental functions (2, 6), while selective factors such as socio-economic status tend to present investigators with samples of children having better than average intellectual capacity. Disregard of the horns of this dilemma has resulted in disaster to the

interpretation of test data on diabetic patients. Baker (2) has summarized the clinical literature and has reported four cases of his own in which insulin shock in diabetics produced permanent functional damage of the central nervous system.

The increasing prevalence of the use of hypoglycemic or anoxic shock treatment (for schizophrenia) has raised questions as to the possible mental effects of these treatments. Graham (56) reported improvement in test scores made by sixty-five mental patients after hypoglycemic shock therapy. The test used included the abbreviated form of the Stanford-Binet, the Rorschach, the Kent-Rosanoff association test, and a series of manual tests. Most evidence of improvement was found in the Rorschach, with least improvement (if any) in intelligence.

Pituitary Gland and Sex Hormones

Among the known physiological effects of the pituitary gland are the regulation of skeletal growth ("growth hormone") and sex maturation ("gonadotropic hormone"). Deficiencies or excesses may occur in either factor. As previously noted, studies made on dwarfs, in whom there is good reason to believe pituitary dysfunction is the underlying cause, show normal mental development (50). One case of gargoylism was found with normal intelligence, so that it is certain that mental deficiency is not necessarily associated with achondroplasia of pituitary origin. No evidence has been found in other studies to corroborate the conclusion that there is an apparent correlation of anterior lobe activity with mental development (103). In animal studies, Burnham and Leonard (30, 31) could find no evidence for impairment of learning ability or of retention after removal of either the pituitary gland or the thyroid, or both.

In seven patients with retarded sex development and obesity (Frohlich's syndrome, thought to be due to pituitary dysfunction and deficiency in gonadotropic hormone), Schott (113) found a median IQ of 132, with none below 100. From these results we may only conclude, as in the case of pituitary growth dysfunction, that intellectual retardation is not necessarily a concomitant of gonadotropic deficiency.

If sex hormones play any extensive part in mental development, significant differences might be expected in mental test scores made by males and females, at least at certain ages. Kuznets and McNemar (69) have critically reviewed the acceptable studies of sex differences in intelligence test scores, concluding that the weight of adequate evidence is against the existence of reliable differences. Many of the studies reviewed by Kuznets and McNemar share the common weakness of drawing conclusions from small differences that lack statistical significance (107). It is of course well established that cases of marked precocity in sexual development do not usually show a corresponding mental acceleration (127). There is, indeed, a tendency for such cases to be mentally retarded. That such is not necessarily the case is indicated by the data of Benton and Hagmann (12),

who reported a normal subsequent mental development in two girls who began to menstruate at seven months and at two years, respectively

Age at menarche—Reymert (105) found no correlation between age at menarche and intelligence in a group of 138 girls in whom the exact year and month of first menstruation were recorded. In 28 girls, the age at menarche was also unrelated to the incidence of behavior problems. Of some methodological interest is a correlation of only .77 between actual age of menarche and the age as recalled by the subjects one to three years following the event (10 percent were in error by more than twelve months). This finding raises serious doubts as to the reliability of various studies in which recalled menarcheal ages have been used.

Effects of Benzedrine on Mental Performance

It is not the purpose of the present review to consider systematically the effects of drugs on mental performance or development (see Spragg, 125). However, the increasing use of benzedrine sulfate, and the many claims made for its efficacy as a mental stimulant, make it advisable to consider some of the recent experimental studies. In previous reviews (119, 121), it was concluded that there was little objective evidence of an increase in mental output or increased learning ability with the ingestion of 10-15 mg. of benzedrine sulfate but that subjective feelings of fatigue and boredom were diminished. Further experiments have provided additional evidence to support this conclusion. For instance, Barmack (3) found no improvement in intelligence test scores among college students on Form A and B of the Otis self-administering test ninety minutes after the administration of 10 mg. of benzedrine sulfate. Nor was attention span in thirty-two subjects altered under similar dosage (5). Fifteen mg. of benzedrine sulfate, administered under controlled conditions to fifteen subjects, had no effect on fatigue in color naming or on the incidence of "blocks" (13). Scores on a syllogistic test of reasoning were not significantly improved by 10 mg. doses of benzedrine (1, 59). In animal experiments, where larger doses of the drug may be used, actual impairment of learning has been reported (46, 87). That at least some human subjects can take the drug daily in large doses (70 mg.) for two or three years without apparent injury was demonstrated by Bloomberg (17) in a study of three patients with narcolepsy.

Using a series of motor tests, two groups of investigators (22, 41) were unable to show significant results from benzedrine administration; the tests included tapping, mirror tracing, reaction time to visual stimuli, and letter cancellation. On the other hand, in experiments by Barmack (4), 15 mg. doses of the drug diminished errors in a motor test (pursuitmeter), the subjects, moreover, reported less inattention, boredom, or irritation with the work and less fatigue or sleepiness. Carl and Turner (33, 34) also found evidence for increased persistence of effort, with administration of benzedrine. They conclude that there is a "favorable reaction in mood,

feeling tone, or affective attitude and this reaction, in combination with various degrees of stimulation in a physiological sense (rise in blood pressure), favors performance in tasks which call for alertness, persistence and freedom from fatigue."

Bradley (19) and others (20, 21, 22) have reported beneficial results with respect to behavior and school performance in children following the administration of 10-15 mg. benzedrine sulfate per day. Teachers noted increased attention to work and greater spontaneous interest in class work among children receiving this drug (19) Henry (61) reported that in fourteen behavior problem children with abnormal electroencephalograms "behavior was markedly improved by benzedrine and to a lesser extent by dilatin" but with no specific effect on the electroencephalogram Cutts and Jasper (42) found clinical improvement but no effect on the electroencephalogram in twelve similar cases In all these reports, the subjective estimates of improvement in behavior could not be corroborated when controlled testing procedures were applied.

Experiments with benzedrine have shown wide individual differences in rate of absorption and sensitivity to the drug, so that future experiments should include physiological measurements, such as blood pressure, to demonstrate the effectiveness of the dosage applied in each subject tested. More experiments are needed to discover the optimal dosage and time of maximum effect after administration of the drug Until such basic questions are more adequately answered, the general use of benzedrine for its supposed mental stimulation should be regarded with suspicion.

Phenobarbital and Other Chemicals

The clinical use of sodium phenobarbital for the control of epileptic seizures gives practical importance to studies of the effect of this drug on learning and mental development When the drug is administered in moderate doses to mature rats no impairment in learning ability is apparent (47). Errors are not significantly affected (93) Near lethal doses of the drug injected at the end of each learning trial produced impairment in even adult animals (134), although the experiment failed to demonstrate the physiological or psychological character of the impairment. That the drug may have definite deleterious effects on later learning ability when injected into young developing animals is suggested by Mendenhall (83) who administered large doses (as much as 100 mg per kg. body wt.) to thirty-day-old rats The dosage continued every 48 hours for 220 days. After a period of 40 days, during which no injections were given, the animals were tested with respect to maze learning and "reasoning." Those subjected to the drug during early development (but not during the learning tests) were definitely inferior to the controls in the learning functions studied. Although the doses used were large and the period of administration long the deleterious effects on later mental development are sugges-

tive; additional controlled experiments should be conducted, with more nearly therapeutic dosages.

Metrazol—Loken (77) subjected rats to convulsions with metrazol injections after they had learned a simple alternation habit but was unable to decide from his data whether the increased time and errors required for learning after a nine-day interval was due to the drug effect or to selective forgetting. Ziskind, Loken, and Gengerelli (141) have recently found evidence of deleterious effects of metrazol, in therapeutic doses, on the transcription of nonsense syllable codes. The number of cases tested was small. In view of the increasing use of metrazol shock therapy in mental disease, further work in this field seems needed.

Other factors—Glick (51) has made the interesting observation that intelligence test scores obtained by Massachusetts State College freshmen during the severe hurricane of 1938 were significantly higher than for any previous class. The investigator was of the opinion that the improved scores could be attributed to the "increased amount of ozone" present in the atmosphere during the testing. This is a hypothesis suitable for an experimental test. In the meantime we already have considerable evidence as to the psychological effects of distraction; if the hurricane exerted an actual influence upon mental test performance, it may have been through facilitation by noise and other distractors rather than through some indirect physiological effect.

Mental Development and Infectious Diseases

Encephalitis—Whether infectious diseases affecting chiefly the central nervous system result in impairment of mental development seems to depend on many unknown factors. For instance, among children with encephalitis, Bender (9) reported marked retardation in the mental abilities revealed by the Goodenough ("drawing a man") test, although Binet IQ was only slightly reduced. For the six cases studied (ages nine to fourteen years) the outstanding features were (a) overactivity, (b) inability to inhibit impulses, (c) limited span of attention, (d) tendencies to come in contact with persons and things by clinging to adults, (e) overaffectionate or aggressive behavior with other children, and (f) touching, handling, or destroying things. These behavior traits were attributed to perceptual difficulties in relation to the subject's own body, reflected in the inability to draw a man. Bender concludes that this is a special disability and is not related to general intellectual impairment. Brown, Jenkins, and Cisler (28), however, found a decrease in average intelligence quotient from one examination to another (average 1.4 points per year) in a group of 108 encephalitic patients (aged two to twenty-six years at first examination). There was some evidence that the progressive decrease in intelligence was somewhat greater in children subjected to the disease before the age of ten years than after. Unfortunately, no series of cases is available in which mental tests were made on patients prior to the disease, so that the

inference of intellectual impairment resulting from the disease must be based on the progressive decline of IQ during chronic disease states. Lord (78) has cited examples of cases in which mental impairment, as reflected in interference with learning to read, followed severe measles, encephalitis, or double mastoid infections. No evidence for depression of mental development following poliomyelitis was found by Gordon, Roberts, and Griffiths (54) in a study of Binet IQ in 98 cases (aged four to sixteen years).

Syphilis—The effect of syphilis on mental development is difficult to evaluate because of possible selective factors. Even though a positive relationship may be demonstrated between the incidence of syphilis and mental defect (58, 84, 88, 139), we cannot be sure to what extent this is due to the tendency for duller individuals to expose themselves to infection and to neglect adequate prophylactic measures. Jenkins, Brown, and Cisler (65) studied Binet IQ's obtained on repeated examination of syphilitic children and nonsyphilitic sibs. An average IQ difference of 11.2 was found in favor of the nonsyphilitics; the difference increased on retests, leading to the conclusion that syphilis in childhood has a retarding influence upon mental development. Other studies have come to similar conclusions. Bazeley and Anderson (7) and Kiss and Rajka (68) have reported that early and intensive treatment for the disease, beginning before the age of six months, will prevent mental retardation. Their evidence on this point cannot be said to be fully adequate.

Tuberculosis—Schultz (116) found no intellectual differences (as measured by the Pressey tests) between adult tubercular patients in a sanatorium and a "representative group in the normal population." Moorman (89) quotes semiscientific and popular opinions which support his clinical observations of striking mental excitations accompanying tuberculosis, especially in those with superior mental abilities. The hypothesis that the tubercle bacillus produces a substance which acts as an excitant to the central nervous system is less attractive to the reviewers than the simpler assumption that greater mental output in tubercular patients, if it exists, is the result of heightened motivation in the face of physical handicaps and enforced inactivity.

Allergy; Heart Disease; Conclusions

The clinical impression that allergic children are more intelligent than normal ones has not received confirmation in quantitative studies (35, 99, 129). When personality questionnaires were administered to 139 allergic children as compared with 117 normals, Riess and De Cillis (106) reported greater "ascendance" among the allergic group. Insignificant differences in the direction of increased extroversions and emotional instability of the allergic group were reported in the same study. These results are not in accord with those of Chobat, Spadavecchia, and De Sanctis (35) who studied a group of twenty girls and forty-five boys and concluded that

"allergic children show all degrees of ascendancy and submission, extroversion and introversion, the tendency being slightly toward submission and introversion for the group as a whole." In view of the small differences reported and the lack of agreement between the studies, it seems justifiable to doubt the existence of any general differences in personality traits of the allergic and nonallergic.

The conclusion of Ross (108) that "the intellectual endowment, as measured by the Binet-Simon intelligence tests, tends to be somewhat lower in the group (of patients) suffering from congenital heart disease" has no justification on the basis of the evidence offered. The data consist of Binet-Simon intelligence test scores of 22 cases (age five to twelve years) of congenital cardiac disease from the Harriet Lane Home. The analysis consisted merely of comparing the frequency distribution of the IQ's of the 22 cases with that of 1,000 cases over the same age range selected from the same institution. A more adequate statistical treatment indicates no significant differences.

By way of summary for this concluding section, it may be said that impairment of mental function and alterations in behavior do accompany diseases in which physiological alterations are known to take place in the central nervous system itself, as in encephalitis. Present information is, however, inadequate to predict the direction or degree of impairment which may be expected in any given case. While hereditary syphilis may interfere with mental development in young children if left untreated, there is no good evidence that alterations in intellectual development tend to accompany diabetes, tuberculosis, diseases of the heart, or allergies.

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CHAPTER IV

Intellectual Changes during Maturity and Old Age¹

IRVING LORGE

THIS REVIEW of intellectual changes during maturity and later has been prepared in terms of the educational need to understand the psychology of the adult. The increasing percentage of older individuals in the United States and the augmented interest in the education of the adult in and out of school are accepted facts. This review will attempt to consolidate the information about intellectual changes from 1936 through 1941.

Reviews

A critical review of the area of adult intelligence up to 1936 has been made (96). Miles (73) also critically appraised the psychological aspects of the aging process, indicating changes in usual interpretation. Lawton (61) surveyed the literature on mental abilities at senescence. Additional reviews are available (21, 25, 56, 82).

Tests of Adult Intelligence

Two tests specially developed for measuring adult intelligence are now available (13, 95). The Babcock and Levy (13) revision of the Babcock test is based on the level efficiency theory (9, 11), whereas the Bellevue-Wechsler tests attempt to measure "the global capacity of the individual to act purposively, to think rationally and to deal effectively with his environment" (95) and also to appraise mental deficiency (15). Guilford (50) revised the Army Alpha test on the basis of factor analyses; Hovland and Wonderlic (54, 102) revised the Otis Self-Administering Test of Mental Ability in terms of an item analysis based on adult responses in the Personnel Test. Lorge (67) prepared a table of percentile equivalents for eight intelligence tests commonly used with adults. Benton (19) showed the influence of Hutt's revised scoring in appraising the performance of adults. Cattell (32, 33) claimed the development of a test freed of cultural influences. Price (78) suggested and developed a discriminating directions test for use with adults. Mitchell (74) showed that higher IQ's are obtained for adults with the 1937 revision of the Stanford-Binet than with the 1916 edition.

Developmental Limits

Freeman and Flory (42), on the basis of repeated tests of an identical population up to age nineteen, found the terminus of intellectual growth

¹ Bibliography for this chapter begins on page 557

as measured by the VACO tests could not be determined but was not earlier than age nineteen. The group, however, was a superior intellectual group—1916 IQ was 115. Wechsler (95) suggested the limit of intellectual growth as not far from age fifteen, although he stated that “the age of maximal functioning mental ability falls between ages 22 and 25 years.” Miles (73) discussed the relation of speed to power intelligence tests and its implication on terminus of intellectual development. Davidson (37) reported a correlation between intelligence tests given ten years apart for a group of employed adults as .89; for subtests for the Bureau VI opposites, .81; verbal relations, .65; number series, .71; and information, .81, indicating the relative stability of the components of an intelligence test. Pintner and Stanton (77), using the CAVD, reported that the intelligence growth curve tends to be parabolic rather than a straight line.

Prediction of Intellectual Status

Several studies showing the relationship between childhood or adolescent status in intelligence and subsequent adult status have been reported. Adams (1) showed that children who go to college have a childhood IQ of 112 as contrasted with 97 for those who do not. Ball (16) indicated that childhood IQ is positively related to subsequent adult occupational level. Baller (17, 18), comparing adults having childhood IQ's under 71 as contrasted to a matched group having childhood IQ's of 100-120, showed the duller group as having prolonged attendance in school, seven times the control group's death-rate, less employability, and greater criminalism. Brody (23), reworking studies (92) and (96), found a closer relationship of achievement to years of schooling than to intelligence, although (96) and (92) reported the interpretation that intelligence is basic to achievement. Terman and others (69, 81, 93, 94) reported that superior status on intelligence in childhood is indicative of superior status on such tests in adult life, high personality ratings, and good standing in college, although a considerable number had not lived up to their ability.

Special Groups

Brown and Hartman (26) surveyed the intelligence of adult prisoners, finding approximately the same average for them as for the Army Alpha draft, a wider dispersion, and a disproportionately greater number of mentally retarded and defectives, although the same proportion of superior intellects as in the general population. Henry and others (35, 52, 53) have made surveys among CCC enrollees, a survey of mental ability in a rural community has been reported (72), and several appraisals of intellectuality among college extension and evening students (70, 71, 92). Wells and others (99, 102), studying one hundred superior men of sharply contrasted incomes, found no statistical differences in intelligence, vocabulary, or personality.

Mental Efficiency and Mental Deterioration

Perhaps the most significant generalization emerging from the literature (57) on intellectual change is the differential decline of vocabulary, information, and verbal tests as compared with performance tests. Babcock (13), utilizing the hypothesis "the first law of mental deterioration is that the oldest learning is last to be lost," developed a test whereby intellectual level is estimated from vocabulary and performance on other tests contrasted with it for level. A discussion of this hypothesis is to be found in her book and articles (9, 10, 11). Additional evidence is to be found in Gilbert's work with the Babcock-Levy tests (45, 47). Yacorzynski (103) indicated, however, that the theory is not sound, even though, operationally, the test discriminates levels of mental functioning. He pointed out that the crudity in scoring the vocabulary test is the primary reason for the apparent stability of vocabulary. Rabin (79), using the Bellevue-Wechsler test, concluded that the process of mental reduction in senility differs from that of schizophrenia. Youtz (104) has confirmed experimentally Jost's laws which are related definitely to the Babcock hypothesis, namely, "Given two associations of the same strength but of different ages, the older one has the greater value on a new repetition; . . . the older falls off less rapidly in a given length of time."

Capps (31) showed that vocabulary decreases with the degree of deterioration in idiopathic epileptics, indicating clinical shrewdness in appraising level from vocabulary. Jastak (55), however, showed vocabulary relatively unaffected in post testing after insulin shock therapy of schizophrenics. Harbinson (51), using Terman vocabulary tests and visual perception tests, found deterioration in melancholias to a greater degree than among schizophrenics. Shipley (86) has made an ingenious self-administering scale for measuring intellectual deterioration and impairment. It can be said that the estimation of deterioration rests upon a reliable and valid measure of vocabulary level.

- Vocabulary

Shakow and Goldman (85) showed the increment of vocabulary scores from age eighteen to age fifty and beyond in groups differentiated by amount of schooling. Christian and Paterson (34) surmised a steady increase in vocabulary from age eighteen to forty with the possibility of a slight increase up to age sixty or seventy in superior adults. Atwell and Wells (8) developed and standardized wide range vocabulary tests and suggested that precision vocabulary levels are lower than wide range recognition vocabulary levels suggesting the implications already referred to (104). Atwell (5) showed that the level of the 1937 Terman vocabulary is generally higher than that obtained from the 1916 list. Brody (24) has revised the 1916 Terman vocabulary for British subjects finding characteristic differences in approach to the test. Such characteristic differences in approach have been appraised experimentally (20).

Memory

Gilbert (46), using Babcock-Levy tests, found, in comparing persons aged sixty to sixty-nine with persons aged twenty to twenty-nine matched for vocabulary level, a loss for the older group in each of eleven tasks involving memory. The losses range from $8\frac{1}{2}$ to 60 percent, depending upon the task. When the memory losses of the brightest young and old are contrasted, the old losses are relatively smaller, ranging from 5 to 36 percent. Gilbert (44), comparing children with adults in the age range thirty to sixty-five, found the hedonistic tendency in memory to be more potent among adults. Shakow and others (84) studied the memory function in normals in order to evaluate memory in psychoses. They reported the curve for the normals as showing "flatness through the 50's and a drop beginning in the seventh decade" and that old versus new recall is definitely related to age in the normals. Kubo (58), however, reported that rote memory did not show a sudden drop until age eighty-two.

Speed and Level

Loerge (62, 66), however, indicated that many of the reported declines in ability are attributable to the measurement of abilities by means of tasks in which speed and power are indiscriminately mixed. Goldfarb (48) showed that speed, experience, and intellect are mixed in the Bellevue-Wechsler. Brown (27) indicated that young adults excel on speed tests although they cannot be distinguished from older adults on a power test. Copeland (36) and his unpublished data indicated that, on the Otis S-A taken under work limit conditions, younger adults take less time to complete the task but the scores are approximately equivalent in the age range fifteen to fifty-five.

Factor Analysis

Balinsky (14) made a Thurstone factor analysis of nine tests of the Bellevue-Wechsler for age groups nine, twelve, fifteen, twenty-five to twenty-nine, thirty-five to forty-four, and fifty to fifty-nine, found no consistent pattern, and concluded that mental tests measure different weighted composites of intellectual ability in different age groups. The implication is clear that evaluation of mental status must be in comparison with normals in the same age range. Goldfarb (48) has made a factor analysis of reaction time, the ten tests of the Bellevue-Wechsler, and speed tests finding at least three factors by the Hotelling method. Altman and Shakow (3) attempted to measure the discrepancy between vocabulary and the 1916 Stanford-Binet (without the vocabulary), as a function of age and other variables. In normals, they found the association to be about zero.

Learning

Most of the material about the learning of adults indicated that adults' learning processes are like those of children, Loerge (63, 64, 65, 68) stress-

ing speed-power relationship and Freeman (39) stressing interests and willingness to learn. Snoddy (90, 91) reported differentiation of facilitational and adaptational aspects in learning of adults. Richards (80) indicated a greater difficulty in unlearning invalid behavior patterns of adults as compared with children. Yokogawa reported to the Sixth Congress of the Japanese Psychological Association (1938) that learning is at a maximum at ages fifteen to nineteen with twenty to twenty-four as next best on speeded tasks. Smeltzer (89) indicated modifiability of younger adults and Ruch (83), the characteristic loss of adults on performance tests.

General

Achievement—Buswell (28, 29) has studied the reading ability of adults, Witty (101) blamed the schools for the reading habits of adults, Norris (75) indicated that adults improve in their abilities in language skills while losing in numerical skills as they grow older. Cameron (30) suggested a genuine difference in thinking processes of older individuals. Goldstein and others (4, 49) suggested that adults in general comprehend heard materials better than read materials, although the differences are not maintained for more difficult material.

Cautions—In appraising intellectual change with advancing age, practice effects must be considered (2, 97, 98), the social milieu of the adult appraised (59), the kind of test items given the adult evaluated (22, 54). In addition, Simon (87, 88) suggested that tests developed for children are not necessarily valid for adults and hence that the mental age concept be abandoned in interpreting the test results of adults.

Technic—Freeman and others (40, 42, 60, 66) indicated the need of a genetic or longitudinal study as contrasted with the age or cross-section method. The only way to determine intellectual change is in the follow-up of an identical population.

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CHAPTER V

Motor Development from Birth to Maturity¹

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IN THE FIELD OF MOTOR DEVELOPMENT during the last few years attention has been focused primarily on studies of the early stages of neuro-muscular development, on studies of age changes and developmental sequences in motor coordinations, and on the standardization of tests of motor skills. There have also been a number of analytical studies concerned with the nature and components of motor abilities.

Neuro-Muscular Development in Infants

McGraw has published a series of articles (54-66) based on her researches in the "Normal Child Development Study of Columbia University." Her data were obtained from analyses of cinema records and protocols of observations of large numbers of infants, supplemented by a few cases who were observed at frequent intervals during their first few years of life. She has compared these behavior analyses with studies on neural development and the onset of cortical control, and offers impressive evidence that the reflex activity of the neonate is subcortical in origin and that as the cortex develops many reflexes disappear when voluntary motor coordinations take their place. The various motor skills cannot be learned until the appropriate neuro-motor functions have matured sufficiently. McGraw's studies have been concerned with sequences of development in the following observed behaviors: rotary-vestibular reactions (55), response to startle (59), crawling and creeping (54), bladder control (57), reaching-prehensile behavior (58), postural adjustments to an inverted position (63), swimming behavior (66), and achievement of erect posture (60). All these developing motor coordinations have been classified into from four to eight successive but overlapping stages of maturity which are shown to be in accord with cortical maturation. Some of these developing behaviors are also presented in motion-picture films: swimming (64), development of sitting posture (62), and assumption of erect posture (61). McGraw has also presented a statement of her theoretical assumptions (53) and has written a nontechnical article (65) applying some of the principles which have appeared from these studies.

The researches of others on young infants are in general in agreement with McGraw's studies and conclusions. Among these are the studies of Goldstein (34), Goldstein and others (35), and Hunt and Landis (39) on the Moro reflex and the startle pattern. Wagner (92) studied in detail

¹ Bibliography for this chapter begins on page 568

the body jerk in the newborn. Stirnimann (90) observed stepping movements in seventy-five infants from three to five months of age and found that these movements were neither related to the method of delivery nor to the child's stage of development. Weisz (95) tested equilibrium reactions of children aged two months to eleven years and found their developmental changes to be related to onset of sitting, standing, and walking. Ribble (78) observed variations in the "instinctive" reactions of newborn babies. Schmeidler (82) observed the relation of fetal activity of one infant to the activity of the mother.

Several studies concerned with early motor development have come from the Yale Psycho-Clinic. Ames has, by the study of cinema films, found precursor signs of plantigrade progression (3) and relationships between stair climbing and prone progression (2). She also found consistency over a period of time for the same infants in speed of motion and skill in creeping, climbing, and prehension (1). Gesell and Ames (30) were able to discriminate, by cinema analysis, twenty-three different stages in the process of attaining upright locomotion, and found that infants progress through about eight cycles of dominance of the flexor and extensor muscles, and similar cycles of bilateral and unilateral dominance in the development of locomotion.

Bergeron (6) has found unilateral movements in infants during the first three months. Friedjung (25) divides activity and control of the hands into two periods, before and after they are free from use in locomotion, and stresses the need for satisfying the infant's normal urge to touch and handle objects.

Later Age Changes and Sex Differences

The studies of developmental changes which occur in various types of skills and motor coordinations may be divided into longitudinal studies, involving repeated observations on the same subjects as they grow older, and cross-sectional studies in which the performances of different children varying in age are compared.

Most of the recently reported longitudinal studies give data on small numbers of cases. McGraw (56) retested Johnny and Jimmy to discover the extent to which early training in skills remained effective at school age. Some skills were retained better than others. She concluded that the maintenance of acceleration in a skill is determined by its degree of integration and stabilization at the time training ceased, on growth changes in body size and proportions, and on attitudes toward the activity. Weinbach (94) fitted an equation to the speed of climbing inclines of differing degrees of steepness as observed for one infant from six months to two years of age. He concluded that there is an optimum angle of 24° and an optimum load of 40 percent of body weight which remains constant with advancing age.

Jones (43) observed twenty-four children from twenty-one through forty-eight months of age in their play with wheel toys. She found that the level of performance was in large part a function of maturation, but that opportunities for practice and several other environmental conditions affected the development of skill. There were also definite sex differences. Bayley (5) reported briefly on the motor development of her growth study cases from birth through ten years.

Age changes in physical strength of adolescent girls were reported by Pryor (76). Tests designed to measure especially coordination, speed, accuracy, and strength were given to 165 adolescent boys and girls by Espenschade (24). These tests were repeated on the same children for seven consecutive school semesters. Mean performance of boys increased steadily and markedly throughout the age range studied, but those of girls in some events reached a maximum at fourteen and declined thereafter. Sex differences were apparent at all ages but were greatest in older children.

There are a few cross-sectional studies of developmental changes which do not present results of standardized tests. Gutteridge (37) made observations on motor play of children two to seven years of age in free play at home and school, and concluded that the usual equipment provided for such play is not adequate for the children's abilities. Wild (97) described the manner of throwing a ball used by children two to seven years of age. Her conclusions about age changes and sex differences are suggestive, but the number of cases is entirely inadequate for this cross-sectional type of treatment. Keeler (44) reported that physical skill of boys, as measured by the Johnson test, increased through school Grades V to XII. Apparently a maximum is reached at chronological age sixteen, and this level is maintained through age twenty. He tested approximately nine hundred boys but reported his findings inadequately in general statements. Grinstead (36) found that the amount of observed movement in the school room decreased with increasing age and IQ. Van der Lugt (48) studied the development of manual dexterity.

The effect of rotation upon boys and girls five to twenty-one years of age was studied by Russo and Dallenbach (81). Children under eleven years tended to enjoy the test more than the older ones. No sex differences were found. Men exceeded women in the initial and final level of skill demonstrated on the Koerth pursuit rotor (12) but women gained more during rest periods. A normative study by Howland (38) on high-school girls indicated that improvement in skill and strength events occurred with age but that jumping ability showed a decline. An investigation of records of professionals in sports showed that the age of optimum performance in combative type games (as football) is twenty-four years, for games of skill (as golf or baseball), twenty-eight years (47).

The subject of motor development in childhood and in adolescence was reviewed by Jersild (41) and the fragmentary nature of the experimental evidence was pointed out.

Measurement of Motor Abilities and Aptitude

Data showing age changes or individual differences in motor skills may be arranged to form standardized test scales, and a number of such tests have been published in the past three years. Some of these are for young children, some for school children, and some for college students. As a rule the scales do not extend over more than one of these three areas.

The field of measurement in gross motor performances has been defined and past research summarized in a recent book by McCloy (51) and in the revision of Bovard and Cozens' text (8). Powell (71) has summarized the present status of physical indices. The Johnson physical skills test, devised as a means of classifying activity classes into homogeneous units (42), has been studied as a possible measure of motor educability (67, 45). The criteria for evaluation have been weak so no conclusions have been reached. Carpenter (15) adapted the Johnson-type tests to the measurement of motor educability in the first three grades. She also presented a battery of tests for measuring speed (14) in the same grades. Her selections were determined by factor analysis of intercorrelations on a battery of tests. A recent study by Brace (9) in the field of motor educability reported a low correlation between the Brace test and the learning of simple motor acts. Tests of agility have been devised and have proved of value in the homogeneous grouping of boys for physical activities (26, 93). The tests are easily and rapidly administered and provide a practical tool for rough classification.

The Gesell tests for the first five years (28, 31), which include motor development, have recently been republished with more detailed directions for administering and scoring. Crider (18) described a simple tapping test and gave tentative norms for five through eleven years.

The measurement of motor ability of girls and women by means of events such as running, jumping, and throwing was reported by Powell and Howe (75) and by Scott (84). This type of test predicted motor performances of girls more accurately than did strength measures. This is equally true for college men according to Cozens (17) and to Sperling (88) and for high-school boys according to McElroy (52). Some strength measures combined with athletic events form the most satisfactory type of test battery. The value of the Sargent jump in predicting the ability of high-school boys to develop power was demonstrated by Van Dalen (91).

A group of studies from Wellesley College on "Neuromuscular Function and Development" (72) has been published. Measures of reaction time with choice, of hesitation time, of alertness, and of coordination were studied and their relationships to gross motor performance examined. The average correlation between these measures and gross motor acts was of the order of .3. Progress in the measurement of achievement in specific activities has been summarized in Glassow and Broer's book (32). McCloy (51) and Bovard and Cozens (8) also reported a number of such studies. The greater part of recent studies in this field has been done on college

women (23, 33, 83), although some work with younger girls has been reported (80).

Influences of Culture and Environment

Dennis (19, 20, 22) observed Hopi Indian children and compared them with white children in such developmental behaviors as first sitting, standing and walking, and manipulation of toys. Hopi infants who were kept bound on cradle boards for from three to six months were not retarded when compared with other Hopi and Navajo infants who had not been bound. In age at onset of walking, the Indian infants are slower than various groups of white infants reported in the literature. It could not be determined whether this is a racial difference or due to other, nongenetic, factors. Dennis also reported observations on two white infants whose first seven months of life were spent under conditions of restricted practice (21). They were found to be not significantly different in their development from infants living in normal environments. Peatman and Higgons (69) tested a selected group of infants with optimal pediatric care and found them to be accelerated in onset of sitting, standing, and walking. The acceleration might be a matter of genetic selection or of superior care and environment.

Gesell (27, 29) reported on a diary made of a child who was found in a wolf's den. He concluded that the child had shown remarkable ability in adapting to quadruped progression and other wolf-like behavior, but that the strength of her human nature was evident in her re-education during her life in the orphanage. It required years for her to attain upright walking and she always reverted to all fours when running.

Skeels and others (87), comparing orphanage children with and without nursery-school experience, found that the preschool children developed faster in motor achievements where they had greater opportunities to practice. Jones (43), as already noted, also found greater skill in play with wheel toys among children with favorable conditions for practice.

Relation to Other Factors

A detailed study of the physical, mental, and "citizenship" qualities of high-school boys has been reported by Ray (77). Boys who participate in athletics are among the superior group of the school in IQ and academic grades, in health, and in the holding of positions of leadership. The relationship in college women between physical and mental ability is slight according to Wellesley College studies (73). Nor can any significant relationship be shown between physical ability and the size of the sub-costal angle, or the judgment of distance.

The effect of undernourishment upon strength can be demonstrated by testing children six to twelve years of age (68). The degree of undernourishment is not significantly related to performance, however. In tests of skill no differences according to nutritional status could be found. Peat-

man and Higgons (70) reported that heavier infants do not as a group stand or walk later than lighter infants. Espenschade (24) found that boys who scored highest on motor tests were anatomically more mature and stronger than the boys who scored lowest. The girls who scored highest tended to be of slender build with little subcutaneous tissue, as compared with the girls making low scores. Stanton (89) compared deaf children with a control group of similar socio-economic status on the Minnesota Mechanical Ability tests and found that the two groups were similar, though both were below the norms established for children of higher socio-economic status.

The Nature of Motor Ability

Within the past three years a number of analyses of motor skills by factor methods have been made. In an investigation of fine motor skills, as steadiness and tapping, Buxton (10) found very low relationships between tests and narrow group factors only. Further studies by Seashore (85) and Seashore, Buxton, and McCollom (86) identified certain group factors, namely, strength, speed, and precision. These authors stated that the factors identified seem to correspond to "qualitative similarities in pattern of action rather than to anatomical units" and recommended motion study rather than statistical methods for further research in this motor field.

An exploratory study by Bass (4) on static and dynamic balance yielded nine factors of which only five were tentatively identified. The importance of the eye in balance is clearly demonstrated and the weighting of tests in the various factors suggests that the eye has several specific functions in balance.

Analyses of gross motor ability by theoretical and experimental methods have been reported by Powell (74), McCloy (49, 50), and Wendler (96). All agree that strength, speed, and coordination are important elements of motor performance. Other factors have been less consistently identified. Richards and Nelson (79) applied the factor analysis technic to the Gesell tests administered to eighty infants at six, twelve, and eighteen months of age and found an "alertness" factor and a "motor" factor present at all three levels. A formula for the measurement of "dynamic strength" in college men has been given by Larson (46) and for "pure strength" in women by Carpenter (13), for "pure speed" or velocity by Hutto (40) and by Coleman (16).

Summary

In general, the recent researches summarized in this chapter show that during the first few years of life maturational factors are of primary importance in the development of motor coordinations; that in the neonate coordinations are reflex in nature and under sub-cortical control. With development of the cortex, voluntary motor responses emerge, and the

order of their maturing is in a cephalo-caudal direction (30, 53). Although the development of motor ability is dependent upon maturation, the acquisition of skill is influenced to a great extent by practice. Differences in performance, however, may be due not only to differences in opportunity for practice but to freedom from inhibitions and to the child's attitude toward the activity.

A variety of standardized tests have been reported for the measurement of these marked individual differences in motor abilities. Such tests make possible more intelligent provisions of play equipment and provide a basis for more adequate planning of the physical education program. The factors most important in tests of motor abilities are found to be strength, speed, and coordination of movements.

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CHAPTER VI

Physical Growth from Birth to Maturity¹

HARRIET J. KELLEY and JANET E REDFIELD

The Curve of Growth

BUNAK (20) STUDIED THE FINAL SIZE of the body and the relative growth in different periods. He found no correlation between rapidity of growth, either during adolescence or the whole growth span, and final size of the body. "The relative growth intensity varies within narrow limits and does not change the general type of the human growth curve, which is . . . a parabola of the fourth order." The curves of increments show the same three characteristic phases of decreasing, increasing, and again decreasing velocity over a span of years. Gould (55) concluded from repeated measurements of female college students at Tulane University that shorter students, regardless of age, grew slightly more in college than did taller students. The finding that young college freshmen represent a physically accelerated group was confirmed. The author believes it unsafe to plot points on a growth curve from averages of different sets of individuals, for each person has spurts and cessations of growth in stature that are masked by average values.

Peatman and Higgons (119) discussed the absolute and relative variability in height and weight of their group of privileged New York children in comparison with Woodbury's series. Their subjects were 1,112 boys and girls, one to sixty months of age. Absolute variability in the two measurements increased with age in both groups, with neither sex consistently more variable than the other, the girls tended to be relatively more variable. Factor analysis studies of growth were made by Mullen (114) and McCloy (99).

Growth in External Dimensions and Body Form

Meredith and Brown (109) presented original and comparative findings on growth in weight of the full-term, nonpathological infant during the first two weeks of postnatal life. Their data were serial weight values from birth to the tenth postnatal day for approximately 1,000 healthy infants of northwest European descent born at the University Hospitals, Iowa City, between 1930 and 1933. Among their findings were the following: male infants consistently exceeded female infants in mean weight between birth and the tenth postnatal day, throughout this period; mean weight was least for first-born infants and greatest for infants of fifth and higher birth order; day-to-day means showed a loss in weight between birth and three days following birth of 215 grams, or 6.2 percent of mean

¹ Bibliography for this chapter begins on page 584

birth weight, but with a good deal of individual variation from this pattern; about 26 percent of the infants regained their birth weights by the close of the first postnatal week and about 52 percent of them by the tenth day; infants tended to approximate their birth weight by ten days of age.

Longitudinal growth records of two healthy girls were reported by Gray and Faber (57). Both girls were of "Old American" stock and were reared in excellent environmental circumstances. The data discussed in this paper were seriatim measurements of stature and weight from birth to adulthood, and the actual growth observed was compared with that predicted by various standards. The best basis found for prophecy was the girl's position in a private-school series in terms of the standard deviation. Weight sometimes diverged markedly from standard and might fluctuate from month to month even in the absence of disease or diet.

A modified longitudinal study of stature and weight measurements made on 493 boys and 459 girls who were followed by the Cleveland Developmental Health Inquiry since 1931 was reported by Simmons and Todd (140). Between two and thirteen years of age, stature was a good basis for prediction over annual intervals and weight somewhat less so. Sex differences in mean stature and mean weight were significant under two and one-half years and at twelve and thirteen years. Mean annual increments in stature formed a negatively accelerated curve until eleven years for girls and twelve years for boys, followed by rises. The mean increment in weight of both boys and girls during the first year of life was approximately double the birth weight; it decreased during the second and third years but with the fourth year began a rise that was maintained through the twelfth year. As a measure of growth, stature was found to be superior to weight. "The stature-weight relationship is shown to be too low for employment of either as a criterion of the other. The use of the age-weight-stature table in individual appraisal is therefore discouraged."

Components of Stature

The growth of the three major components of stature—head and neck, trunk, and lower extremities—was investigated by Merodith (106). The data consisted of approximately 2,700 values for each dimension, obtained on 740 children of northwest European descent between seven and seventeen years. Trends in growth, changes in proportion of mean stature, and the interrelation of the three dimensions were studied. Van Dusen (154) studied the relative size of the upper extremities in children and adults. Donelson and others (43) reported measurements of 1,013 college women from the states of Iowa, Kansas, Minnesota, Ohio, and Oklahoma. Four hundred and thirty-seven of the subjects were "Old Americans." The measurements taken were height, weight, chest breadth and depth, girth of the arms and left leg, and pressure of the right and left hands. Among the findings were. "The means for the Old Americans were slightly smaller for all measurements than the means for those not classed as Old Ameri-

cans, with the exception of the chest breadth and depth which were no different; the girth measurements were significantly smaller. . . . The women measured for this study excel in height and weight previously measured college women from the respective states."

Goldstein (53) investigated the changes in the dimensions and form of the head with age in the same individuals. Length of head showed a high annual increment between two and five years, a sharp drop until seven, a plateau with pulsations of growth until thirteen years, followed by acceleration in males and deceleration in females. Increment was more a function of age than of initial size. A high increment one year was generally followed by a lower increment the next year. A definite relation was found between head growth and menarcheal age. Marked changes of cephalic index may occur in the same individual in the course of time. "A substantial proportion of cases—over 30 percent between six and seventeen years—change from one index category to another during the course of growth and development. The most common transition is from brachycephaly to mesocephaly." Davenport (32) discussed the marked changes that occur in the proportion of head height to head length in the fetus, infant, and child, and their dependence on environmental and genetic factors.

Growth changes of the face from birth to eight years, based on serial roentgenograms, were reported by Brodie (17). Atkinson (7) presented stages of growth of the mandible and maxilla. Data on the development of the nose from conception to maturity were given by Davenport (33). Goldstein (52) studied the development of the bridge of the nose through measurements of five hundred Hebrew males between three and twenty-one years, and of fifty old men. Transverse impressions of the bridge were obtained by means of a profile gauge; the tracings of these were recorded, and the widths measured at 2, 6, 10, 15, and 20 mm. from the apex.

A series of studies of pelvic type by Roentgen pelvimetry was published by Greulich and Thoms (58, 59) and Greulich, Thoms, and Twaddle (60). They found no typically "male" or "female" pelvic index. "The type of pelvis that is described in textbooks of anatomy and of obstetrics as the 'normal' female pelvis was found in only 15 per cent of 582 primigravid white women from the obstetric clinic of the New Haven Hospital, 57 per cent of 104 student nurses who were of somewhat different racial stock and a much more privileged economic group than the clinic women, and 85 per cent of 107 young girls who ranged in age from five to fifteen years. Only 32 per cent of the 686 adults of this series had the type of pelvis which, according to the anthropologic literature, is proper for white women."

Factors Conditioning Growth

Geographic and temporal factors—Reviewing the Harvard Growth Study data, Shuttleworth (136) found that certain years are good growing years while others are poor. Mills (113), Hoffman (65), and Etheredge and Judah (46) observed a tendency toward a decline in height and other

physical measurements from one year to another. Mills compared 607 students at the University of Michigan in 1899-1900 with 1,178 students in 1938; Etheredge and Judah observed yearly changes in height and weight from 1917 to 1937. The *Journal of the American Medical Association* (76) noted no differences in the 1885-1908, 1909-1927, and the 1922 and 1934 groups. Perhaps the decrease observed in college students is due to changes in population produced by such factors as race and socio-economic status. In Lloyd-Jones' study (94) of 100,000 boys and girls, ages six to eighteen years, the California-born were taller at every age (the average difference being about 1.27 cm.) than those born elsewhere.

Holmes' study (66) of Japanese migrants to Hawaii indicates they are, on the average, heavier than the sedentes, their shoulders are wider, trunks shorter, legs and distal arm segments longer, and their chests are broader but shallower. Their heads are higher, with wider bigonial diameters and longer total and upper face heights. Japanese males born in Hawaii are 4.11 cm. and females 1.71 cm. taller than those born in Japan. In general, the Hawaiian-born deviated from the Japanese residents in the same direction as the regional migrants but to a still greater extent.

Race—Schlutz and others (131) found Negroes to be inferior to whites but socio-economic status was not comparable. Steggerda and Petty (149), and Metheny (111) took complete measurements on groups of Negro and white college students and made comparisons by means of the critical ratio. They found differences in certain ratios, measurements, and indices to be significantly different. For the ages five to eleven years, Lloyd-Jones (95) found whites to be the tallest and heaviest, Negroes next, then Mexicans; while the Japanese were shortest and lightest. Jenness (72) found that children of Italian ancestry gained more slowly than those of American ancestry. Meredith (108) obtained similar results in a study of 281 children of North European ancestry and 146 children of Italian ancestry, ages seven to seventeen years.

Heredity—The studies on twins, and particularly MacArthur's study (97) of trends of growth in the Dionne quintuplets, indicate the powerful influence of heredity. The studies of identical versus fraternal twins, as that of Rife (128), compared the influence of heredity with that of environment on physical characteristics. Identical twins reared apart yet so alike physically as were Lois and Louise (51) give us an indication of the influence of heredity on physical status.

Birth Conditions—Illingworth (70) studied records of 150 infants considered as premature because at birth they weighed five and a half pounds or less. Using Holt's standards, 86 percent of the premature group were underweight at one year as compared with 34 percent for a control series. Cole (27) reported that maternal shock increases the loss in weight by the newborn and that factors that tend to retard the second stage of labor reduce this loss. Gray's (56) "big babies," weighing over 4,000 grams at birth, have continued to weigh more than average children of their age during their first two years of life.

Illness—No indication of any general retarding influences of illness on physical growth could be demonstrated by Hardy (61), who correlated eighteen different measurements with frequency of ordinary illnesses during the first twelve years of life of 218 white boys and 197 white girls between the ages of six and thirteen years and 115 white boys and 124 white girls up to twenty years of age, omitting the period of adolescence. Turner and others (153) found that in Grades III, IV, V, and VI children who failed to gain in weight for each of three successive months represented 3.6 percent of the school population. Of these, 70 percent had histories of recent illness.

Obesity—Bruch (18) found that eighty obese children, ranging in age from 2.5 to 13 years, showed markedly advanced stature, skeletal maturation, and early onset of puberty.

Activity—Mateff (104) reported greater gains in height and weight during vacations than during the school year, perhaps owing to season or greater activity. Adams (1) and Beall (13) found activity to be a stimulator of physical growth and certain measurements to be an index of success in certain activities, although the evidence was not conclusive.

Diet—Levine (92) found, in a comparison of children born in the United States versus those born in Holland, Japan, and China, that improved nutrition resulted in increase of growth. Norman (116) reached the same conclusion after comparing five hundred public-school boys on an excellent diet with five hundred secondary-school boys on an inferior diet. In Norman's study the difference in height was chiefly a difference in length of leg. Jeans and Stearn (71) found a greater rate of linear growth for infants receiving an average daily intake of 340 units of Vitamin D than for infants receiving either more or less. Litchfield and others (93) observed that 55 percent of prematures given Vitamin B complex showed a gain in weight during the first week of life, as compared with 8 percent of prematures on average diets. At the age of 2.5 weeks, 95 percent of the Vitamin B complex group showed a gain in weight as compared with 48 percent for the controls. The Vitamin B complex group attained four or five times the birth weight at three months, whereas the controls had doubled or tripled their birth weight at that age.

Pubescence

Shuttleworth (137) analyzed data from the Harvard Growth Study on 747 girls and 711 boys in terms of age at the close of the year of maximum growth in stature and compared these results with those obtained by grouping in relation to menarcheal age. Twenty-two dimensions were studied. The average MG-age for girls was 12.5 years and for boys, 14.8 years. Growth patterns for each sex were similar, but boys showed larger increments and more intense accelerating phases. The inflection points marking the transition between decelerating and accelerating growth and between accelerating and decelerating growth were intimately timed, in the

case of girls, with the advent of the menarche; similar inflection points on the growth patterns of boys might also be timed in relation to significant stages in the process of sexual maturation. Two sets of tables for predicting the average age at menarche for girls between the ages of ten and fourteen years were provided by Shuttleworth (138). The first group of tables is based on present height and weight and gives reliability correlations ranging from .37 to .53. The second tabulation depends on gain in stature and weight in the preceding year; its correlations vary from .51 to .72.

A method of classifying variations in body build in adolescent girls, based on breast development, hair distribution, the sitting height-stature and bicristal-biacromial indices, was devised by Bayer (9). Data on the age at menarche and the characteristics of the menstrual cycles of a group of adolescent girls (11) indicated that those classified as "feminine" in body build reached menarche within a narrower age range and had fewer abnormal menstrual periods than girls of other types of build.

Davenport, Renfro, and Hallock (35) investigated the relation between the basal metabolic rate and growth in weight and stature of fifty-five boys and fifty-five girls over a period of from five to eight years during adolescence. About the same results were obtained whether change in percentage departure from standard basal metabolism or the individual's own base line was used. Most mass correlations were not over +0.36; intra-individual correlations varied from -1.00 to +1.00. Correlations of change in basal metabolism with change in body weight were somewhat higher than with change in stature; ". . . during the adolescent spurt the increased B.M. processes associated with increasing weight may amount to 10 percent or more of the basal metabolism as determined before and after this spurt."

Appraisal of Physical Status: Build and Weight

Jenss and Souther (73) gave detailed descriptions of the indices commonly used: Baldwin-Wood tables, based on age and height; the ACH (Arm-Chest-Hip) Index of Franzen; Nutritional Status Indices of Franzen; and Pryor's Width-Weight Tables. The four indices were evaluated, using a group of 713 seven-year-old children. There was no agreement among them and not one of the indices was considered satisfactory. Clinical judgment was resorted to but this, too, was unsatisfactory. Jorgensen and Hatlestad (75) also tried to evaluate a number of anthropometric indices; finally they resorted to factor analysis and then concluded that there are no definite types but a continuous distribution of builds from the extreme linear to the extreme lateral. Dearborn and Rothney (39) considered indices a mistake and preferred a prediction equator of normal weight from chest depth, chest width, stature, and bi-iliac diameter. They considered it to be 20 percent more efficient than Baldwin-Wood height-weight tables for fourteen- to eighteen-year-old boys and girls.

One big factor to be considered in determining normal weight and build is that of time required to make the estimate. The ACH Index was developed, not because it was considered a superior method, but because the determination requires less time. In like manner, the percentage index—normal weight as determined by McCloy's standard divided by weight given by the Baldwin-Wood tables—was determined as a substitute for McCloy's prediction equation of four measurements. If physical status were a constant factor it would enable one to correct the Baldwin-Wood normal weight after the McCloy normal was once determined. Metheny (112) tested the percentage index and found that it could be used as a substitute for the second year, but the variability was too great to use it if the interval was more than two years.

Wetzel (159) presented a grid as a short-cut for the use of clinicians. The grid provides a graphical method of relating height and weight. Lines on the grid indicate whether or not the build or nutritional status of an individual has altered.

Dentition

Diamond and Weinmann (41) discussed the formation of normal enamel matrix and its calcification, and disturbances in matrix formation and in calcification. They presented evidence to justify the concept that formation of the enamel matrix is completed before calcification begins and that calcification occurs first at the tips of the enamel cusps. Davis (37) summarized the development of the human tooth, giving tables for deciduous and permanent teeth which list for each tooth the various stages of dentition. Schour and Massler (132, 133) separate the structure of the human tooth into the propioidonal structures (dentin and enamel), pulp, and the paradontal structures (cementum, alveolar bone, periodontal membrane, and gingivae). The tooth passes through four developmental stages: (1) growth, (2) calcification, (3) eruption, and (4) attrition. Before birth (four to six months *in utero*) the deciduous teeth begin the apposition to enamel and dentin in regular sequence, from central incisor to second molar. The first permanent molar is the first tooth of the permanent dentition formed as well as erupted. The bicuspid and second permanent molars begin their formation at 1.5 to 3 years of age, the third molars at 7 to 10 years. It takes from 7 to 14 months for the formation of the crown of a deciduous tooth, while it takes from 3 to 6 years for a permanent tooth. Root formation begins when the crown is completed. The root of a deciduous tooth requires 1.5 to 2.5 years for completion; the root of a permanent tooth, from 5 to 7 years.

Dental Caries

The incidence of dental caries was reported by Klein and Palmer (84) for 1,891 high-school boys and girls, separately, and for age groups from thirteen to nineteen years, inclusive. Blackerby (14) compared the dental

defects of 1,117 Negro children with a group of 11,674 white children considered to be of a similar socio-economic level. Dental care was required by 80 percent of whites and 67 percent of the Negroes. The average number of caries lesions was four for the white and two for the Negro children. Burke (22), Butler (24), Pollia (121), and Roberts and others (129) reported better dental condition for children on the more nutritive diets. Speidel and Stearns (148) found that infants receiving from 300 to 400 units of Vitamin D daily showed earlier eruption than infants receiving either more or less Vitamin D. Klein and Palmer (81, 82), in a study of 4,416 elementary-school children, reported that certain families were characterized by immunity to caries, others by susceptibility.

East and Kaiser (45), Klein and Palmer (83, 85), and Sloman (142) reported articles on the relationship of dental caries to age, sex, or environment. Sloman found the incidence of caries to be significantly higher in girls than in boys, but this rate was reduced for both males and females during middle life. Klein and Palmer found that, considering the tooth age of each tooth, there is no difference between the sexes but that there is a difference for chronological age. East and Kaiser found that caries rate was significantly lower in regions with more sunshine, and that mean winter temperature had only slight influence on the caries rate for all boys and for girls from nine to eleven years of age, but that for younger and older girls it was important. East (44), in a later study of city children, found the same to be true. Bodecker (15) reported a modified dental caries index, which takes into consideration the number of carious or filled surfaces and their areas, and a susceptibility caries index. Palmer and others (117) presented a method of determining post-eruptive tooth age. Massler and others (103) found that from birth to ten months is the period of greatest susceptibility to hypoplastic defects in the enamel and is also the period in which the poorest calcification takes place.

Ossification of the Skeleton

Krogman (89), Wahl (155), Hellman (62), Brodie (17), Atkinson (7), Cohen (26), and Goldstein and Stanton (54) reported changes in the facial dimensions which precede, parallel, or follow stages of tooth eruption. Krogman (89) found that at birth facial dimensions are 40 percent of adult height, 60 percent of adult breadth, 70 percent of adult length, while at five years, 80 percent of adult height, 85 percent of adult breadth, and 85 percent of adult length have been achieved. The remaining 15 to 20 percent of growth is spread over ten to fifteen years. Atkinson (7) reported the mandible at birth as being a more or less thin shell of growing bone, the body of which seems entirely composed of the crypts of the developing teeth, and further reduced to a state of porosity by the abundance of vessels present. Cohen (26) found that for twenty-eight children, studied annually, between the ages of 3.5 and 13.5 years, inclusive, the pattern usually followed was of greatest lateral growth in the dental arch

occurring in the cuspid area. The greatest growth in this area occurs during eruption of the permanent teeth. Goldstein and Stanton (54) investigated 285 children at annual intervals between two and twelve years of age and found that during one year the widths of the alveolar arches manifest decrement or stability in a considerable proportion of the cases, especially between three and five years.

Davenport and Renfroe (34), in a study of roentgenograms of forty-six boys and fifty girls beginning at ten to fourteen years of age and following through to fifteen to eighteen years, reported that sex difference in the areas of sagittal section of the sella turcica appears early. Conel (30) presented a detailed description of the changes which occur in the structure of the cortex during the first month of post-natal life. The growth of the epiphyses takes place, according to Siegling (139), by proliferation of the articular cartilage followed by endochondral ossification. The epiphyseal cartilage is a negligible factor, if any, in longitudinal growth of the epiphyses. The normal hip is vividly described with lines and angles by Burman and Clark (23), for the first year of life. Sontag and others (146) published a table for the number of centers present in the upper and lower extremities for age groups of one month, ranging from one to sixty. The greatest acceleration occurred between twelve and forty-two months for girls and from eighteen to forty-eight months for boys. Pyle and Menino (126), using Flory and Todd's standards, gave findings for children at three- or six-month intervals from birth to five years of age. Bayer and Newell (12) found it difficult to observe six-month-interval differences in many of the series of roentgenograms and advised use of one-year intervals.

Rate of ossification can be hastened or retarded by various factors. Sontag and Pyle (145) reported thyroid deficiency as one factor; Francis (48), that constitutional metabolic disturbances, such as illness, produced a slowing up; MacNair (100) and Roberts and others (129) reported that nutritive factors, such as additional banana or cod liver oil in institutional diets, hasten the rate of ossification. Piyor (125) pointed out that carpal sequence is, to a large extent, controlled by genetic factors. Sontag and Harris (144) found tarsal striae appearing in roentgenograms of one-month-old children, most frequently in roentgenograms of children whose mothers had difficult pregnancies and in instances when the delivery was particularly difficult.

Growth in Body Structure and Internal Organs

Wilmer (161) analyzed the structural components of the body at six lunar months, birth, and maturity, and illustrated the quantitative changes in them. The relative proportion of skin and superficial fat rose prenatally; nervous and skeletal tissues decreased, and the visceral mass and voluntary musculature remained unchanged. Postnatally the muscular component rose; nervous and visceral tissues decreased, and the proportions of skin and fat and skeleton remained unchanged. A similar study was made of skin and subcutaneous tissue in relation to surface area (162). The growth

of bone, muscle, and overlying tissues of the leg area shown in serial roentgenograms was studied by Stuart, Hill, and Shaw (150). Films of the antero-posterior view of the right leg were cut apart and the portions covered by the respective shadows weighed on a chemical balance to ten milligram values. Data from boys and girls between three and eighty-four months of age were tabulated into groups containing between thirty-two and seventy-nine subjects

The development of the paranasal sinuses from birth to late adolescence was reported by Maresh (101). Tracings were made from routine postero-anterior roentgenograms of one hundred children examined at frequent intervals beginning during the first month of life, in most cases, and continuing over periods of from five to fourteen years. Davenport and Renfroe (34) studied the adolescent development of the sella turcica and frontal sinus by consecutive lateral roentgenograms taken over a five-year period between ten and eighteen years of age. Todd and others (152) presented data on the growth in weight of the human eyeball. Growth, in general, appeared to follow brain growth, but final adult weight showed no correlation with cranial capacity. Approximate childhood weight was reached by three years, with a secondary growth period suggested at adolescence.

Comeau and White (29) found a linear correlation between heart volume and body weight and surface, but not body height. In a further study of build and heart size (28), they compared twenty pairs of identical twins with fifteen pairs of unrelated individuals matched for body height, weight, and age. They found a close correspondence in heart size in the series of twins and a somewhat less marked relationship in matched individuals. They concluded that "heart size in normal individuals is dependent principally on body build, and genetic, racial, and environmental factors are usually important chiefly as they affect body structure."

The relation between the size of the thymus shadow and birth weight in 2,000 infants was investigated by Donaldson (42). Some degree of enlargement was found in 18 percent of the cases. The author concluded that the size of the thymus was proportionate to body size. Krumbhaar and Lippincott (91) compiled data on the post-mortem size of the spleen in 4,000 persons. The weight of the apparently normal spleen fluctuated within extremely wide limits. Maximum weight was attained in the sixteen- to twenty-year age period; between twenty-six and sixty-five years the average remained approximately unchanged but thereafter fell rapidly. Hwang and Krumbhaar (69) reported a study of the human appendix in three hundred persons. The appendix as a whole attained its maximum weight about the age of puberty and then decreased throughout the age span more slowly than the lymphatic tissue.

Technics of Research in Physical Growth and Anthropometry

Weinbach (158) proposed that the surface area of the body may be estimated by multiplying twice the girth of the right thigh by the height

When applied to subjects from birth to eighteen years this method gave results about 2.5 percent lower but very closely correlated with values obtained from the DuBois formula. He also described (157) a method of computing the center of gravity, moment of inertia, and surface area from front and lateral photographs. Burch, Cohen, and Neumann (21) devised a means of measuring small irregular areas of the body by the use of lead discs of uniform diameter and thickness. A cast is made of the part to be measured, the number of discs required to cover the given area determined, and the value computed by weight.

Various technics of measuring auricular height in the living were reviewed by Howells (68) and the reliability of the results analyzed. He recommended the use of an instrument making contact with both sides of the head simultaneously, such as the head spanner. Chattopadhyay (25) criticized Ashley-Montagu's method for locating the nasion in the living adult, maintaining that it could be more accurately determined by palpation. Ashley-Montagu (6) presented data on the reliability of his technic and the difficulties of palpating this landmark. A method of locating the porion in the living was described by Ashley-Montagu (5).

Maresh and Deming (102) studied the pattern of growth of the left humerus, radius, ulna, femur, tibia, and fibula of eighty infants during the first six months of life, as shown by serial roentgenograms and by anthropometric measurements. The mean rates of growth obtained by the two methods were similar, but individual rates of growth calculated from the roentgenograms were less variable than those based on anthropometry. A similar study of the growth of the left tibia from three months to thirteen years of age was made by Francis (49), who also found the two methods comparable.

Further studies in the methodology of anthropometry were reported by Meredith and Goodman (110) and Redfield and Meredith (127). The research usefulness of routine hospital records of length at birth was evaluated by Meredith and Goodman (110). The subjects were one hundred normal white infants measured within twenty-four hours of birth. The mean difference between two independent determinations of length by trained anthropometrists was 2.44 mm., less than one-half of 1 percent of mean stature at birth. For approximately half of the subjects the difference did not exceed 1 mm., and for 92 percent it did not exceed 5 mm. The mean difference between the anthropometrists' measurements and the hospital records was 11.2 mm., more than four times as great. The routine hospital records would be adequate if nothing beyond a measure of central tendency of birth length were required, for the difference between the means of the two series was not statistically significant; but the variability of the group indicated by the hospital measurements was spuriously high, and the measurements of individual infants would be inadequate data for a longitudinal study. Redfield and Meredith (127) found appreciable changes in stature and sitting height of four-year-old children associated with an afternoon rest period. The mean gain in stature with rest was equal to two months' growth for

children of this age, indicating that repeated measurements at bimonthly or quarterly intervals should be made at a constant interval from time of rest.

Sources of error in estimating heart size by the usual roentgenographic methods were discussed by Keys and Friedell (79). On the basis of their technic, which included a kymograph recording, they recommended the equation: Volume = 0.63 (area)^{1/3}. Comeau and White (29) also checked the Rohrer-Kahlstorf formula by measuring the volumes of models constructed from Roentgen measurements, and found errors ranging from -11 to +26 percent in normal hearts. A method to increase the validity of judging posture was devised by Korb (86). Deviations were noted by projecting the silhouette of the subject on a screen painted with lines representing the standard of excellent posture set up by Klein. Reliability coefficients averaged .91 on repeated scoring of fifty silhouettes. Anderson and Cohen (4) found that the inclusion of incomplete series of data in a longitudinal study of dental arch development distorted the underlying trends rather than adding to the significance of the results.

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¹ Corrected to January 1, 1942. Errors should be reported to the secretary-treasurer immediately.

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